

Title: Part Econ Model

Date: May 03, 2009 11:15 AM

URL: <http://pirsa.org/09050045>

Abstract: Perturbation Theory Out of Equilibrium

An Ecological Model of the US Economy

# The PartEcon Story

Particle Economics Research Institute

Bruce Sawhill

Jim Herriot

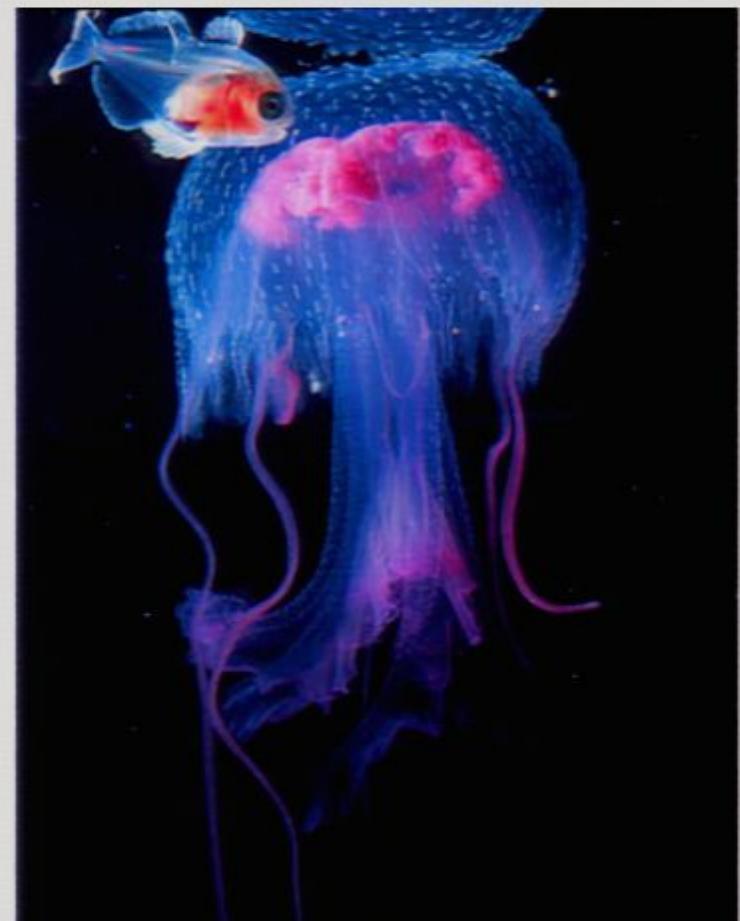
(Zoe-Vonna Palmrose)

(Mike Brown)

May 3, 2009

# Early Inspirations

- The Club of Rome (15)
- Population Biology applied to game theory in the IPD (Lindgren/Nordahl, Tesfatsion)
- Meta systems of Lotka-Volterra Eqns.(Jain, etc.)
- SOC systems
  - Sandpiles (Bak, et al)
  - Forest fires (Drossel etc)
  - Food webs (Sole et al)
- Dynamics of N-K Networks
  - What if the networks could modify their logic and topology under evolutionary pressure?



# Early Inspirations

- Population Biology applied to game theory in the IPD (Lindgren/Nordahl, Tesfatsion)
- Meta systems of Lotka-Volterra Eqns.(Jain, etc.)
- SOC systems
  - Sandpiles (Bak, et al)
  - Forest fires (Drossel etc)
  - Food webs (Sole et al)
- Dynamics of N-K Networks
  - What if the networks could modify their logic and topology under evolutionary pressure?



# The PartEcon Story

Particle Economics Research Institute

Bruce Sawhill

Jim Herriot

(Zoe-Vonna Palmrose)

(Mike Brown)

May 3, 2009

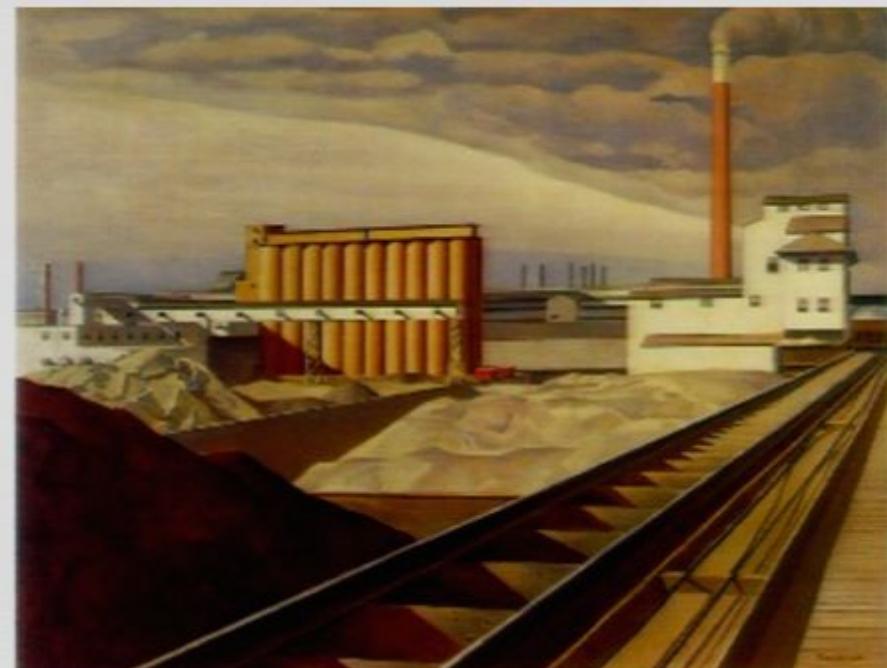
# Early Inspirations

- Dynamics of N-K Networks
  - What if the networks could modify their logic and topology under evolutionary pressure?



# First attempts

- Emergence of more sophisticated agent based modeling techniques
- Early attempt: “The Numeconomy” (98)
  - Godel/Turing, “Do space”
  - Alchemy of Fontana
  - Autocatalytic sets, work of Morowitz, Farmer, Kauffman
  - Cobbled together w/JH



# Accountants? You Gotta Be Kidding!

- "Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist."--Keynes
- Accountants are the particle physicists of economics
  - Deal with the "atomic-level" interactions of economics
  - Accounting: The Rules of the Game:
    - *"I call 'em as I see 'em.*
    - *If I don't see 'em, I make 'em up.*
    - *If I don't call 'em, they ain't nothin"*-Y. Berra
  - Dynamics of economic system are emergent from atomic interactions
  - Not necessarily a practical macroeconomic description, but a pathway to higher level descriptions
- Especially useful if particle physics metaphor can be enlarged to include extensible alphabets

# Why ‘Particle Economics’?

- **Search for Fundamentals**
  - Many economic ideas are not sufficiently atomic - too many “skyhooks” and “*Deus ex machina*”
  - Inspiration from particle physics: Simple symmetric laws generate thermodynamics, symmetry breaking, etc.
- **Evolutionary Economics**
  - Present theories are “ecological” in nature
  - How do creation and economic activity interact?
    - If system wasn’t driven, wouldn’t it just run down?
  - 80-90% of wealth created in 20<sup>th</sup> century came from new stuff, not better ways of doing old stuff. (Innovation vs. optimization)

# Classic Fundamentals

- Equilibrium
- Exogenous
  - Utility Functions
  - Supply/Demand
  - Money
  - Firms
  - Resources
  - Consumers

# Mysteries of Economics

- *Horse/buggy/blacksmith shop/buggy whip maker/...*  
    ~ gives way to ~
- *car/tires/gas station/drive in movies/cops/bribes to cops/...*
- We can't predict what will come next  
    ~ but ~
- Can we model the metaprocess?
- Cf. Kuhn's 'Structure of Scientific Revolutions'
- Schumpeter's Gales

# The Hierarchy of Structures

- Accounting : Particle Physics
  - Lowest level interactions, reversible
- Microeconomics: Game Theory
  - Negotiation built on the above
  - Here enters the notion of *agency*
- Macroeconomic Evolution: Non-Equilibrium Statistical Mechanics
  - Emergent structures from the iteration and interaction of the above elements
  - Accessible through simulation
- Evolutionary or MacroMacroEconomics:
  - How new goods and services enter the system and old ones leave
  - 3rd quantization

# The Four Epistemological Whammies in Economics

- Physics like
  - Measurement event is fundamental (collapse of wavefunction)
  - Even when measurement happens, uncertainty persists
- Biology like
  - Speciation (inspiration for PartEcon)
  - Incommensurate Measure

# Accounting for PartEcon

- Build first of several attempts at an evolutionary model (1999-2001)
- Nodes could
  - Buy
  - Sell
  - Haggle
  - Dbl. entry accounting
  - Local currency
  - Inventory plus currency
  - Random injection of new processes into system

# The Self-Constructing Econosphere

- Emergent Value
  - ‘A house is worth what someone will pay for it’
- Emergent Measure
  - There is no pre-specified *global* measure of value
- Emergent Identity
  - ‘How does a wall know it’s a wall?’
  - Two tests:
    - Can it be made? (Production, “Laws of Physics”)
    - Can it be sold? (Sales, “Beauty Contest”)
  - Context Dependent Answer: “It Depends”

# Open Questions

- Emergence of money
  - Formation of currency communities
- Lifetime distribution of entities
- Wealth distribution of entities
- Unit of Selection problem
  - Involves Institutions and regulation
- Creation/Extinction cascades
  - Node level, industry level
- Limiting cases (neoclassical econ!)
- Relation to physics:
  - Energetics and thermodynamics
- Introduction of higher level entities
  - Banks, stock market
- Relation to ecology and environment
  - Limits to growth, complexity, sustainability

# The PartEcon Model

- Work in progress
  - Test bed for experiments
  - Looking to answer a number of open questions
- Agents
  - Connected by buy-sell and barter relationships – various topologies
  - Competition among agents for buy and sell operations
  - Creation and extinction events – manual and automatic
- Units
  - Produce/transform “things” like eggs into omelets
  - Pay with “things”
- Change
  - Metabolism: transformations, eg  $a \rightarrow b$
  - Trading: barter, emergent currency
- Accounting
  - Record all transactions
  - Full double entry debit/credit bookkeeping
- Instrumentation
  - Animation – agents, trading activity, fabric of loops, etc.
  - Spreadsheet-like text
  - Graphs

## Slides

- Relation to ecology and environment
  - Limits to growth, complexity, sustainability

## The PartEcon Model

- Work in progress
  - Test bed for experiments
  - Looking to answer a number of open questions
- Agents
  - Connected by buy-sell and barter relationships – various topologies
  - Competition among agents for buy and sell operations
  - Creation and extinction events – manual and automatic
- Units
  - Produce/transform "things" like eggs into omelets
  - Pay with "things"
- Change
  - Metabolism: transformations, eg a → b
  - Trading: barter, emergent currency
- Accounting
  - Record all transactions
  - Full double entry debit/credit bookkeeping
- Instrumentation
  - Animation – agents, trading activity, fabric of loops, etc.
  - Spreadsheet-like text
  - Graphs

# The PartEcon Model

- **Work in progress**
  - Test bed for experiments
  - Looking to answer a number of open questions
- **Agents**
  - Connected by buy-sell and barter relationships – various topologies
  - Competition among agents for buy and sell operations
  - Creation and extinction events – manual and automatic
- **Units**
  - Produce/transform "things" like eggs into omelets
  - Pay with "things"
- **Change**
  - Metabolism: transformations, eg a → b
  - Trading: barter, emergent currency
- **Accounting**
  - Record all transactions
  - Full double entry debit/credit bookkeeping
- **Instrumentation**
  - Animation – agents, trading activity, fabric of loops, etc.
  - Spreadsheet-like text
  - Graphs

Click to add notes

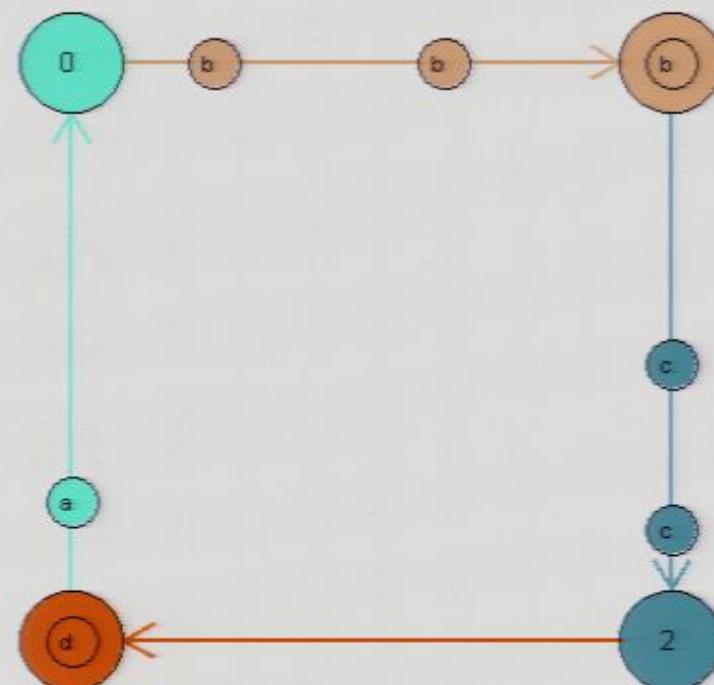
## rtecon 09.04.02

|        |        |        |       |        |
|--------|--------|--------|-------|--------|
| all    | param  | statu  | color | meta   |
| rev    | cells  | links  | units | prods  |
| vbose  | cbank  | uacct  | cells | xplor  |
| inuse  | rlinks | inuse  | links | metas  |
| pool   | xacct  | pool   | syncs | abc    |
| pcolor | post   | pcolor | units | rand   |
| www    | accts  | accts  | invis | slots  |
| psort  | psort  | loops  | off   | bank   |
| pspell | psell  | psell  | trail | jump   |
|        |        |        | prev  | white  |
|        |        |        | Short | gen    |
|        |        |        |       | off    |
|        |        |        |       | trails |
|        |        |        |       | prev   |
|        |        |        |       | bypass |
|        |        |        |       | wheel  |

|        |        |       |       |        |        |
|--------|--------|-------|-------|--------|--------|
| cid    | uid    | metas | xplor | abc    | rand   |
| prod   | uprod  | cells | bank  | slots  | ran2   |
| cbank  | uacct  | links | delu  | comp   | comp   |
| rlinks | inuse  | syncs | gen   | square | square |
| xacct  | pool   | units | off   | funnel | funnel |
| post   | pcolor | accts | invis | prev   | bypass |
| psort  | psort  | loops | acol  | Short  | wheel  |
| psell  | psell  |       |       |        |        |

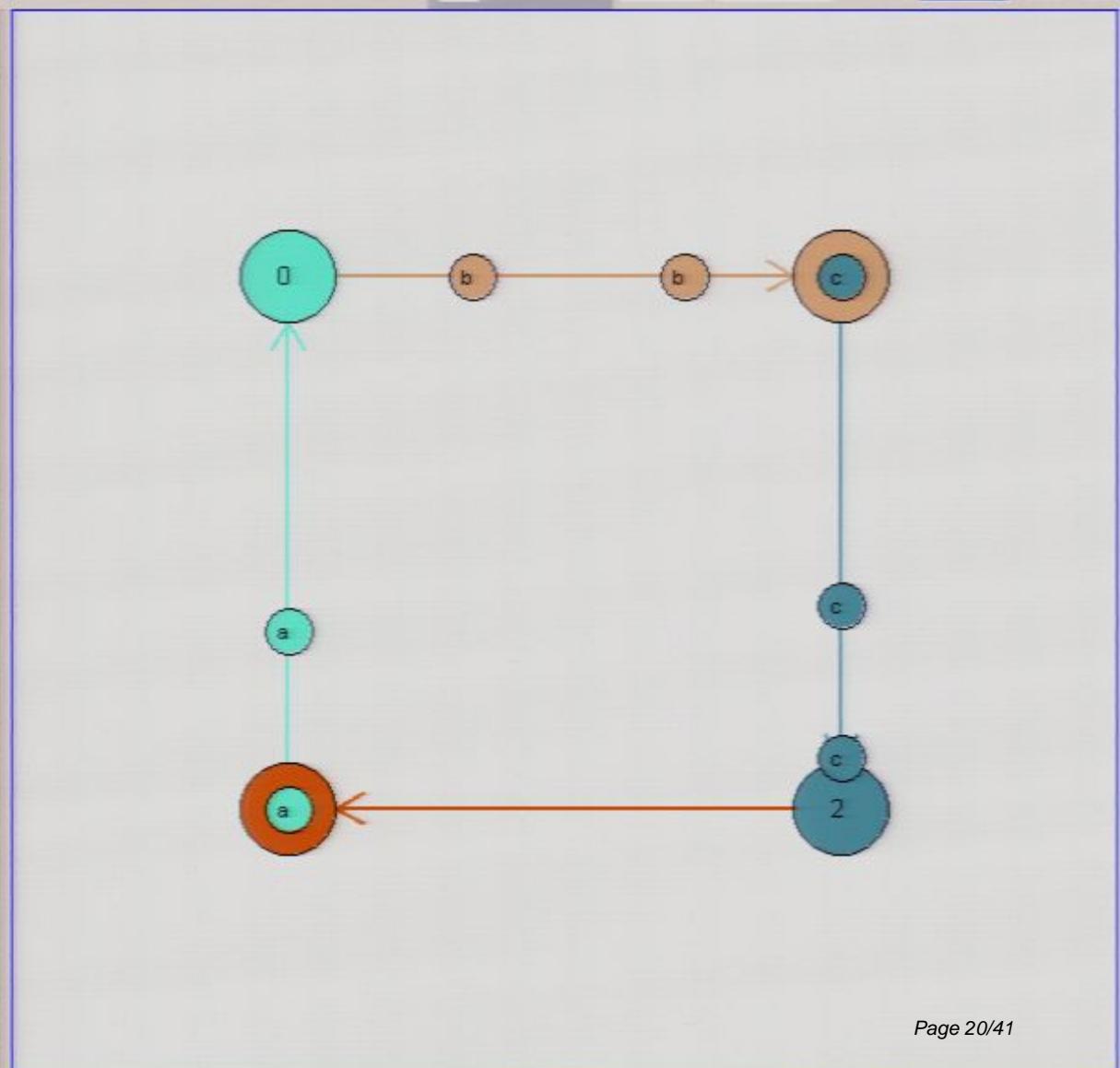
|       |        |       |       |         |
|-------|--------|-------|-------|---------|
| +cell | 0      | ready | go    | refresh |
| test  | econ 0 |       | clear | quit    |
| clean | reg 0  |       | more  |         |
| proc  | 0      |       | +cell | +s      |
|       | 0      |       | uzoom | +       |

|     |    |    |    |    |
|-----|----|----|----|----|
| 0   | gm | gl | pl | gr |
| 1   |    |    |    |    |
| new | 0  |    |    |    |

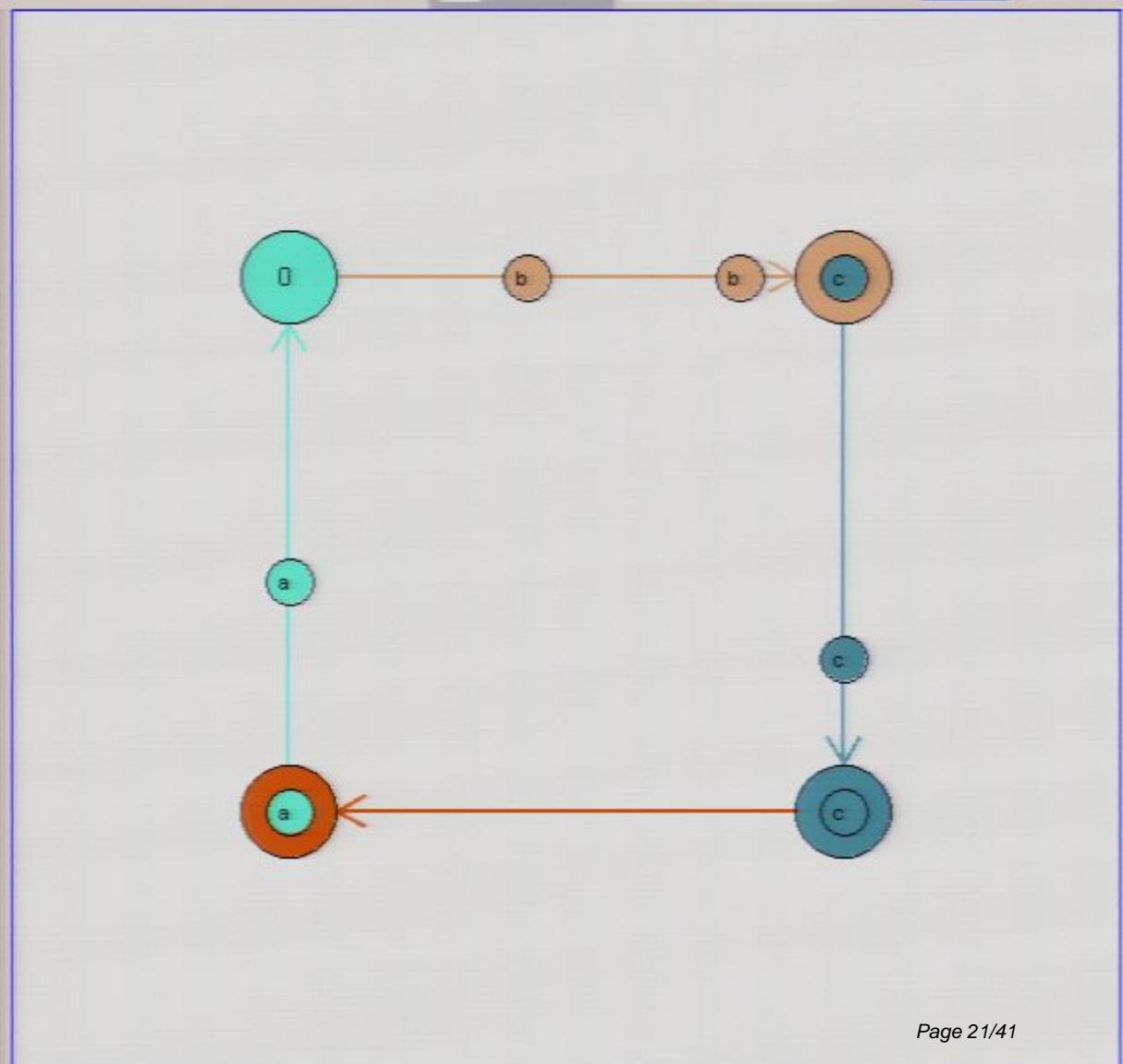


## rtecon 09.04.02

|        |       |        |       |       |        |        |       |       |       |        |       |     |        |         |      |
|--------|-------|--------|-------|-------|--------|--------|-------|-------|-------|--------|-------|-----|--------|---------|------|
| all    | param | status | color | meta  | cid    | uid    | metas | xplor | abc   | rand   | +cell | 0   | paused | refresh | quit |
| rev    |       |        |       |       | prod   | uprod  | cells | bank  | slots | ran2   |       | go  |        |         |      |
| vbose  | cells | links  | units | prods | cbank  | uacct  | links | delu  | jump  | comp   | test  | 1   |        | clear   | more |
| inuse  | paths | loops  | whos  | what  | rlinks | inuse  | syncs | gen   | white | square | clean | new | gm     | +cell   | +s   |
| pool   |       |        |       |       | xacct  | pool   | units | off   | trail | funnel | proc  | 2   | gl     | ++x     |      |
| pcolor | wwx   | accts  | hist  | graf  | post   | pcolor | acct  | invis | prev  | bypass |       |     | pl     | uzoom   |      |
| psort  |       |        |       |       | none   | psort  | loops | acol  | Short | wheel  |       |     | gr     | +       |      |
| pspell | curr  | clear  | newu  | simp  | psell  | psell  |       |       |       |        |       |     |        | -       |      |



|        |        |        |       |       |   |   |   |                                |   |   |                                 |                                 |                                |                                |                                |  |  |  |
|--------|--------|--------|-------|-------|---|---|---|--------------------------------|---|---|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--|--|--|
| all    | param  | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input type="checkbox"/> rand             | <input type="checkbox"/> +cell  | <input type="checkbox"/> econ   | 0                              | 0                              | paused                         | <input type="checkbox"/> refresh       | <input type="checkbox"/> quit          |  |
| rev    | prod   | uprod  | cells | links | <input type="checkbox"/> uprod          | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank             | <input type="checkbox"/> slots | <input type="checkbox"/> abc            | <input type="checkbox"/> ran2             | <input type="checkbox"/> test   | <input type="checkbox"/> econ   | 0                              | <input type="checkbox"/> go    | <input type="checkbox"/> clear | <input type="checkbox"/> more          |  |  |
| vbose  | cbank  | uacct  | units | prods | <input type="checkbox"/> cbank          | <input checked="" type="checkbox"/> uacct | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp             | <input type="checkbox"/> clean  | <input type="checkbox"/> reg    | 0                              | <input type="checkbox"/> new   | <input type="checkbox"/> +cell | <input type="checkbox"/> +s            | <input type="checkbox"/> +x            |  |
| inuse  | rlinks | inuse  | what  | xacct | <input type="checkbox"/> rlinks         | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input checked="" type="checkbox"/> squar | <input type="checkbox"/> funnel | <input type="checkbox"/> bypass | <input type="checkbox"/> wheel | <input type="checkbox"/> 0     | <input type="checkbox"/> gm    | <input checked="" type="checkbox"/> gl | <input checked="" type="checkbox"/> pl | <input checked="" type="checkbox"/> gr |
| pool   | loops  | pool   | hist  | graf  | <input type="checkbox"/> loops          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off   | <input type="checkbox"/> trail          | <input type="checkbox"/> acol             | <input type="checkbox"/> proc   | <input type="checkbox"/> 0      | <input type="checkbox"/> 3     | <input type="checkbox"/> uzoom | <input type="checkbox"/> +     | <input type="checkbox"/> -             |  |  |
| pcolor | wxx    | accts  | hist  | graf  | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> invis | <input type="checkbox"/> prev           | <input type="checkbox"/> Short            | <input type="checkbox"/> wheel  |                                 |                                |                                |                                |  |  |  |
| psort  | curr   | clear  | newu  | simpl | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel            |                                 |                                 |                                |                                |                                |  |  |  |
| pspell |        |        |       |       | <input type="checkbox"/> psell          | <input type="checkbox"/> psell            |   |                                |   |   |                                 |                                 |                                |                                |                                |  |  |  |



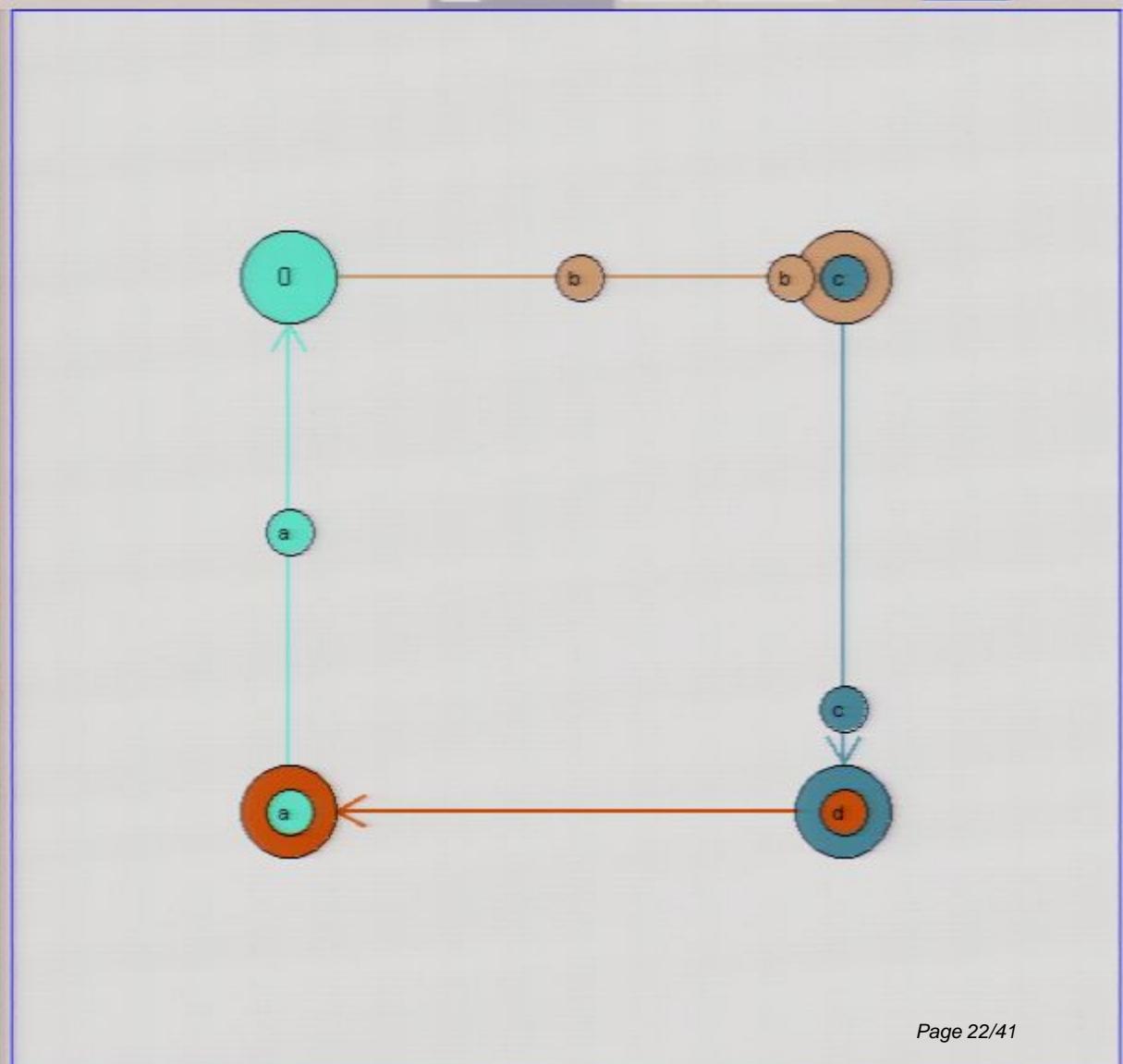
## rtecon 09.04.02

|        |       |        |       |       |   |   |   |                                |   |                                 |                                |                                 |                                |                               |                                 |  |  |  |
|--------|-------|--------|-------|-------|---|---|---|--------------------------------|---|---------------------------------|--------------------------------|---------------------------------|--------------------------------|-------------------------------|---------------------------------|--|--|--|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input type="checkbox"/> rand   | <input type="checkbox"/> +cell | <input type="checkbox"/> econ   | 0                              | 0                             | paused                          | <input type="checkbox"/> refresh       | <input type="checkbox"/> quit          |  |
| rev    | prod  | links  | units | prods | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2   | <input type="checkbox"/> test  | <input type="checkbox"/> comp   |                                |                               |                                 | <input type="checkbox"/> clear         | <input type="checkbox"/> more          |  |
| vbose  | cells | rlinks | whos  | what  | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp   | <input type="checkbox"/> clean | <input type="checkbox"/> square | <input type="checkbox"/> econ  | 0                             | <input type="checkbox"/> gm     | <input checked="" type="checkbox"/> gl | <input checked="" type="checkbox"/> pl | <input checked="" type="checkbox"/> gr |
| inuse  | paths | loops  |       |       | <input type="checkbox"/> rilinks        | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input type="checkbox"/> funnel | <input type="checkbox"/> proc  | <input type="checkbox"/> off    | <input type="checkbox"/> trail | <input type="checkbox"/> prev | <input type="checkbox"/> bypass | <input type="checkbox"/> wheel         |  |  |
| pool   | wwx   | acct   | hist  | graf  | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> invis | <input type="checkbox"/> Short          | <input type="checkbox"/> acol   |                                |                                 |                                |                               |                                 |  |  |  |
| pcolor |       |        |       |       | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> loops | <input type="checkbox"/> acol           |                                 |                                |                                 |                                |                               |                                 |  |  |  |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> psell | <input type="checkbox"/> acol           |                                 |                                |                                 |                                |                               |                                 |  |  |  |
| psell  |       |        |       |       |   |   |   |                                |   |                                 |                                |                                 |                                |                               |                                 |  |  |  |

new 4

0 1 2 3 4 5 6 7 8 9

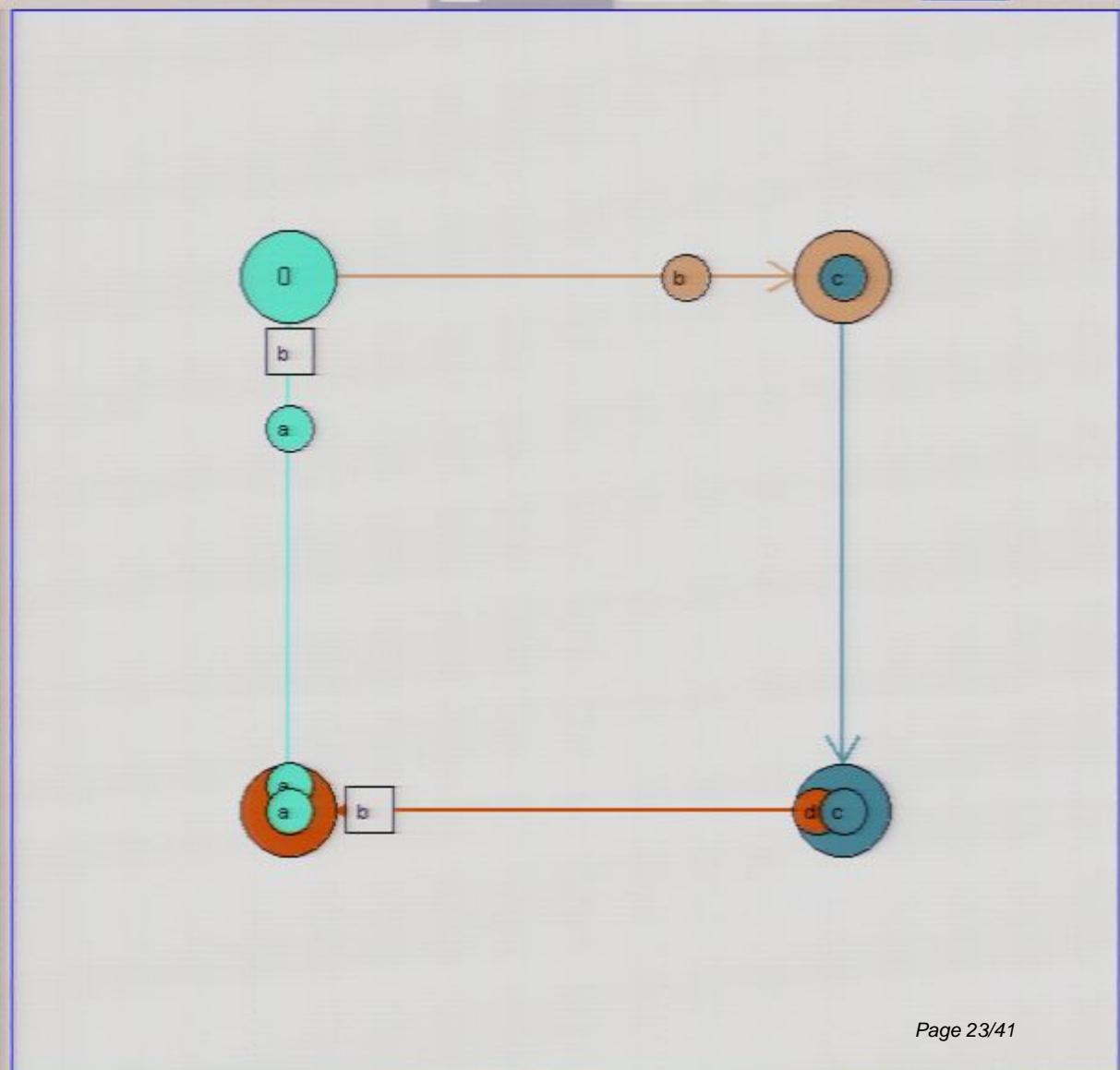
+cell +s +x uzoom + -



## rtecon 09.04.02

|        |       |        |       |       |   |   |   |                                |   |  |                                |                                 |   |        |                                  |                               |
|--------|-------|--------|-------|-------|---|---|---|--------------------------------|---|--|--------------------------------|---------------------------------|---|--------|----------------------------------|-------------------------------|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input type="checkbox"/> rand              | <input type="checkbox"/> +cell | <input type="checkbox"/> econ 0 | 0 | paused | <input type="checkbox"/> refresh | <input type="checkbox"/> quit |
| rev    |       |        |       |       | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2              |                                |                                 |   |        |                                  |                               |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp              | <input type="checkbox"/> test  |                                 |   |        |                                  |                               |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rlinks         | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input checked="" type="checkbox"/> square | <input type="checkbox"/> clean | <input type="checkbox"/> reg 0  |   |        |                                  |                               |
| pool   | www   | acct   | hist  | graf  | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel            | <input type="checkbox"/> proc  |                                 |   |        |                                  |                               |
| pcolor |       |        |       |       | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass            |                                |                                 |   |        |                                  |                               |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel             |                                |                                 |   |        |                                  |                               |
| psell  |       |        |       |       | <input type="checkbox"/> curr           | <input type="checkbox"/> clear            | <input type="checkbox"/> newu             | <input type="checkbox"/> psell |   |  |                                |                                 |   |        |                                  |                               |

new 7



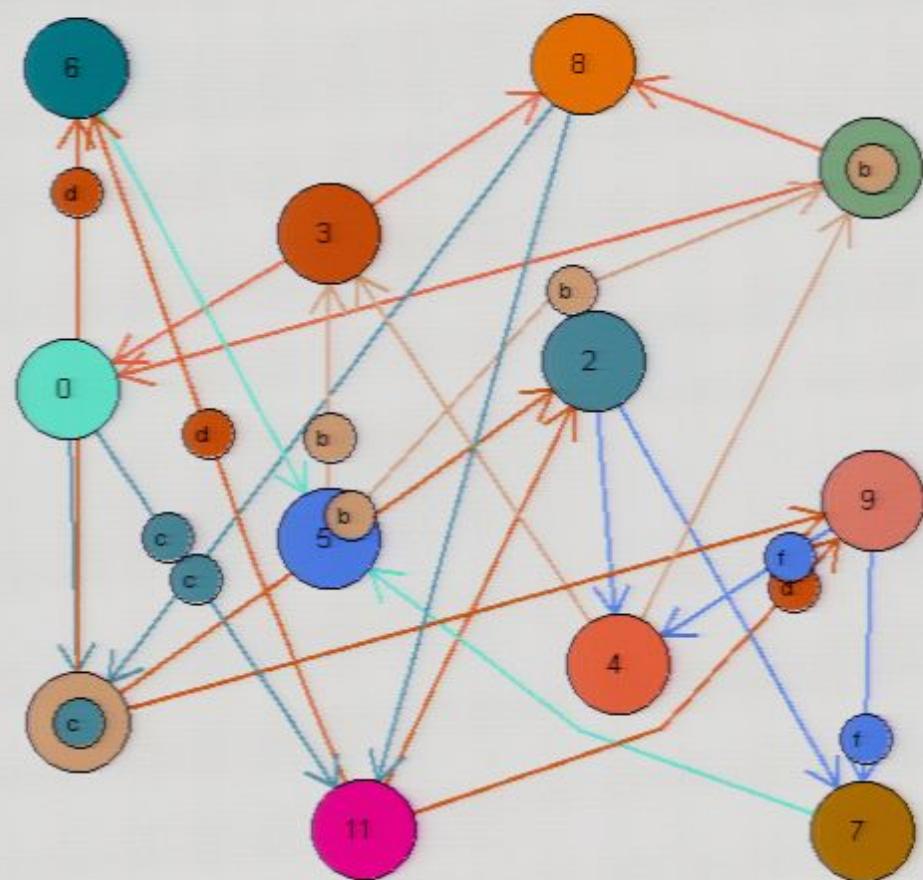
|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  |       |        |       |       |
| pool   | paths | loops  | whos  | what  |
| pcolor | www   | acct   | hist  | graf  |
| psort  |       |        |       |       |
| psell  | curr  | clear  | newu  | simpl |

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | acct  | invis | prev  | bypass |
| none   | psort  | loops | acol  | Short | wheel  |
|        | psell  | psell |       |       |        |

|       |      |       |         |
|-------|------|-------|---------|
| +cell | 0    | ready | go      |
| test  | econ | 0     | refresh |
| clean | reg  | 0     | quit    |
| proc  | 0    |       |         |

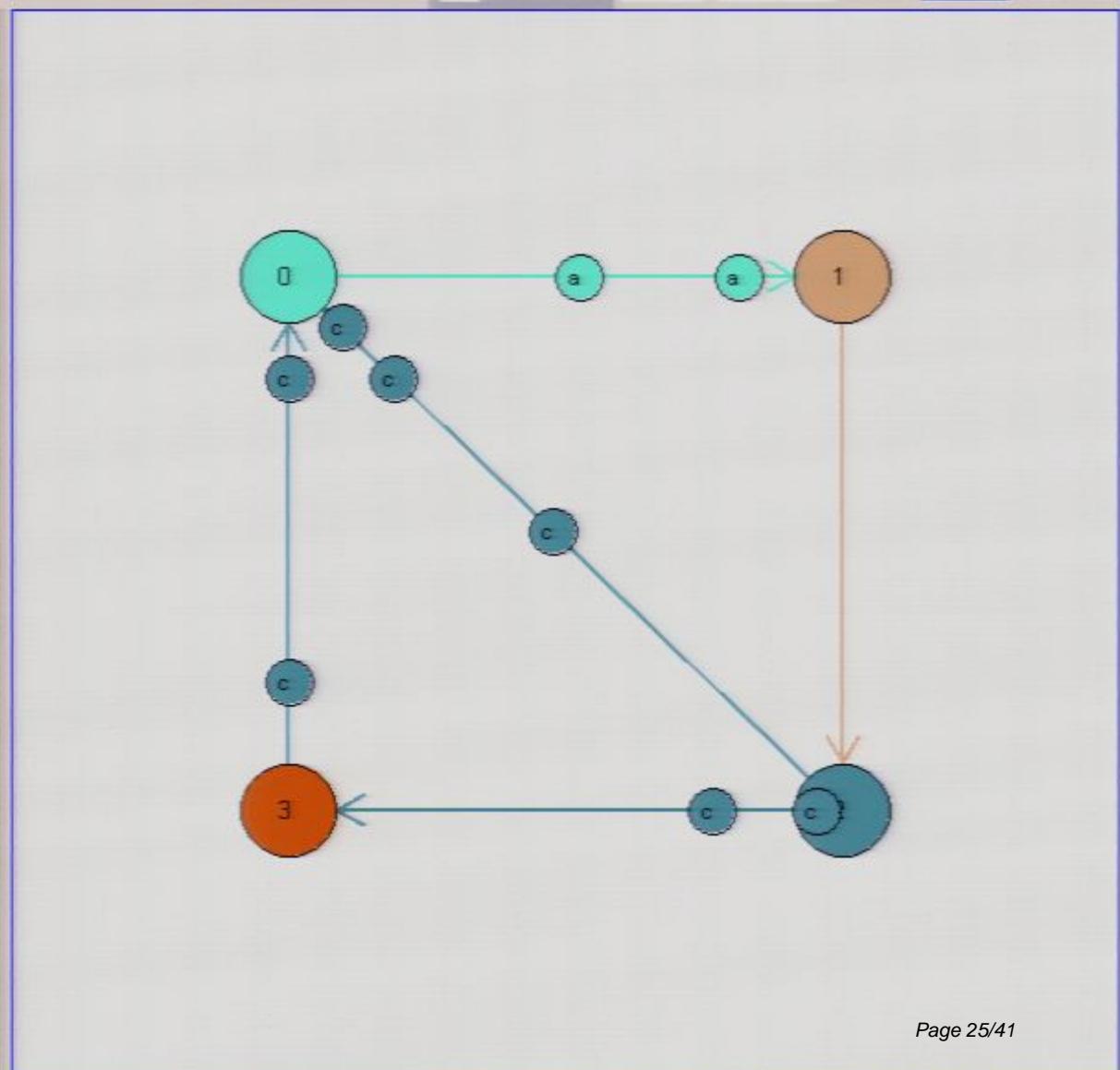
|     |    |    |    |    |
|-----|----|----|----|----|
| 0   | gm | gl | pl | gr |
| 1   |    |    |    |    |
| new |    |    |    |    |
| 0   |    |    |    |    |

|         |      |
|---------|------|
| refresh | quit |
| clear   | more |
| +cell   | +s   |
| uzoom   | +    |



recon 09.04.02

|        |       |                                |   |   |   |   |   |                                |   |  |                                |                              |                              |                                  |  |  |  |
|--------|-------|--------------------------------|---|---|---|---|---|--------------------------------|---|--|--------------------------------|------------------------------|------------------------------|----------------------------------|--|--|--|
| all    | param | status                         | color                                     | meta                                      | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input type="checkbox"/> rand              | <input type="checkbox"/> +cell | 0                            | ready                        | <input type="checkbox"/> refresh | <input type="checkbox"/> quit          |  |  |
| rev    | prod  | uprod                          | <input checked="" type="checkbox"/> cells | <input checked="" type="checkbox"/> links | <input type="checkbox"/> uprod          | <input checked="" type="checkbox"/> uacct | <input checked="" type="checkbox"/> inuse | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2              | <input type="checkbox"/> econ  | 0                            | <input type="checkbox"/> go  | <input type="checkbox"/> clear   | <input type="checkbox"/> more          |  |  |
| vbose  | cbank | <input type="checkbox"/> units | <input type="checkbox"/> prods            | <input type="checkbox"/> rilinks          | <input type="checkbox"/> links          | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp              | <input type="checkbox"/> test  | <input type="checkbox"/> reg | 0                            | <input type="checkbox"/> 1       | <input type="checkbox"/> +cell         | <input type="checkbox"/> +s            | <input type="checkbox"/> +x            |
| inuse  | xacct | <input type="checkbox"/> what  | <input type="checkbox"/> hist             | <input type="checkbox"/> loops            | <input type="checkbox"/> pool           | <input type="checkbox"/> units            | <input type="checkbox"/> off              | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input type="checkbox"/> square            | <input type="checkbox"/> clean | <input type="checkbox"/> 0   | <input type="checkbox"/> new | <input type="checkbox"/> gm      | <input checked="" type="checkbox"/> gl | <input checked="" type="checkbox"/> pl | <input checked="" type="checkbox"/> gr |
| pool   | post  | <input type="checkbox"/> what  | <input type="checkbox"/> graf             | <input type="checkbox"/> curr             | <input type="checkbox"/> accts          | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> prev           | <input checked="" type="checkbox"/> funnel | <input type="checkbox"/> proc  | <input type="checkbox"/> 0   | <input type="checkbox"/> 0   | <input type="checkbox"/> uzoom   | <input type="checkbox"/> +             | <input type="checkbox"/> -             |  |
| pcolor | psort | <input type="checkbox"/> simp  | <input type="checkbox"/> pspell           | <input type="checkbox"/> psell            | <input type="checkbox"/> psell          | <input type="checkbox"/> psell            | <input type="checkbox"/> psell            | <input type="checkbox"/> Short | <input type="checkbox"/> bypass         | <input type="checkbox"/> wheel             |                                |                              |                              |                                  |  |  |  |

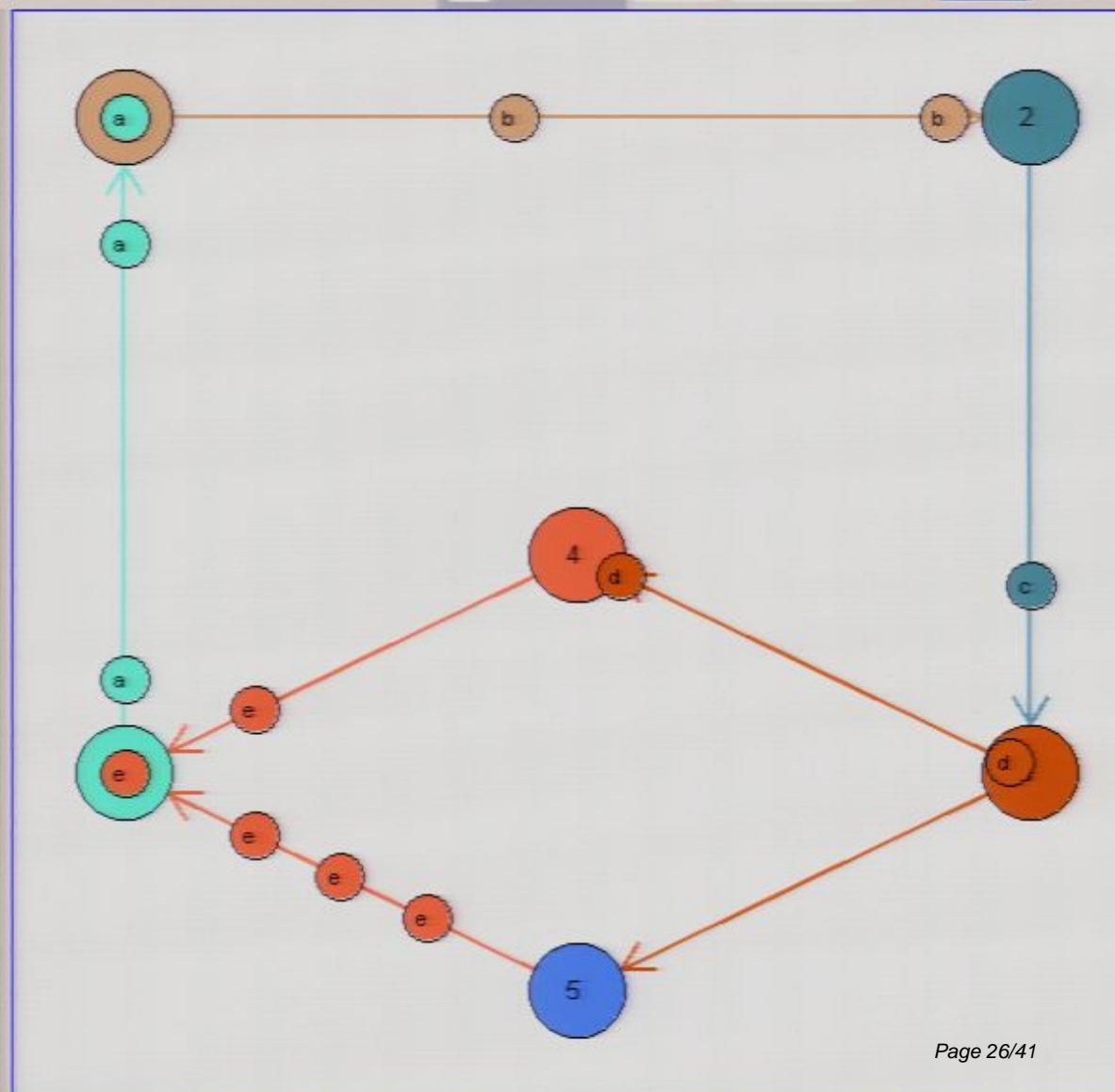


## rtecon 09.04.02

|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    | cells | links  | units | prods |
| vbose  | paths | loops  | whos  | what  |
| inuse  | xacct | pool   | units | graf  |
| pool   | wwx   | acct   | hist  |       |
| pcolor | psort | curr   | clear |       |
| psort  | psell | newu   | simpl |       |

|        |        |       |       |       |        |       |       |
|--------|--------|-------|-------|-------|--------|-------|-------|
| cid    | uid    | metas | xplor | abc   | rand   | +cell | 0     |
| prod   | uprod  | cells | bank  | slots | ran2   | test  | ready |
| cbank  | uacct  | links | delu  | jump  | comp   | clean | 0     |
| rlinks | inuse  | syncs | gen   | white | square | proc  | 0     |
| xacct  | pool   | units | off   | trail | funnel |       | 0     |
| post   | pcolor | accts | invis | prev  | bypass |       | 0     |
| none   | psort  | loops | acol  | Short | wheel  |       | 0     |
|        | psell  |       |       |       |        |       |       |

|     |             |         |       |
|-----|-------------|---------|-------|
| go  | 0           | refresh | quit  |
| 1   | ready       | clear   | more  |
| new | gm gl pl gr | +cell   | +s +x |
|     |             | uzoom   | +     |



## rtecon 09.04.02

|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  | paths | loops  | whos  | what  |
| pool   | wwx   | acct   | hist  | graf  |
| pcolor |       |        |       |       |
| psort  | curr  | clear  | newu  | simp  |
| psell  |       |        |       |       |

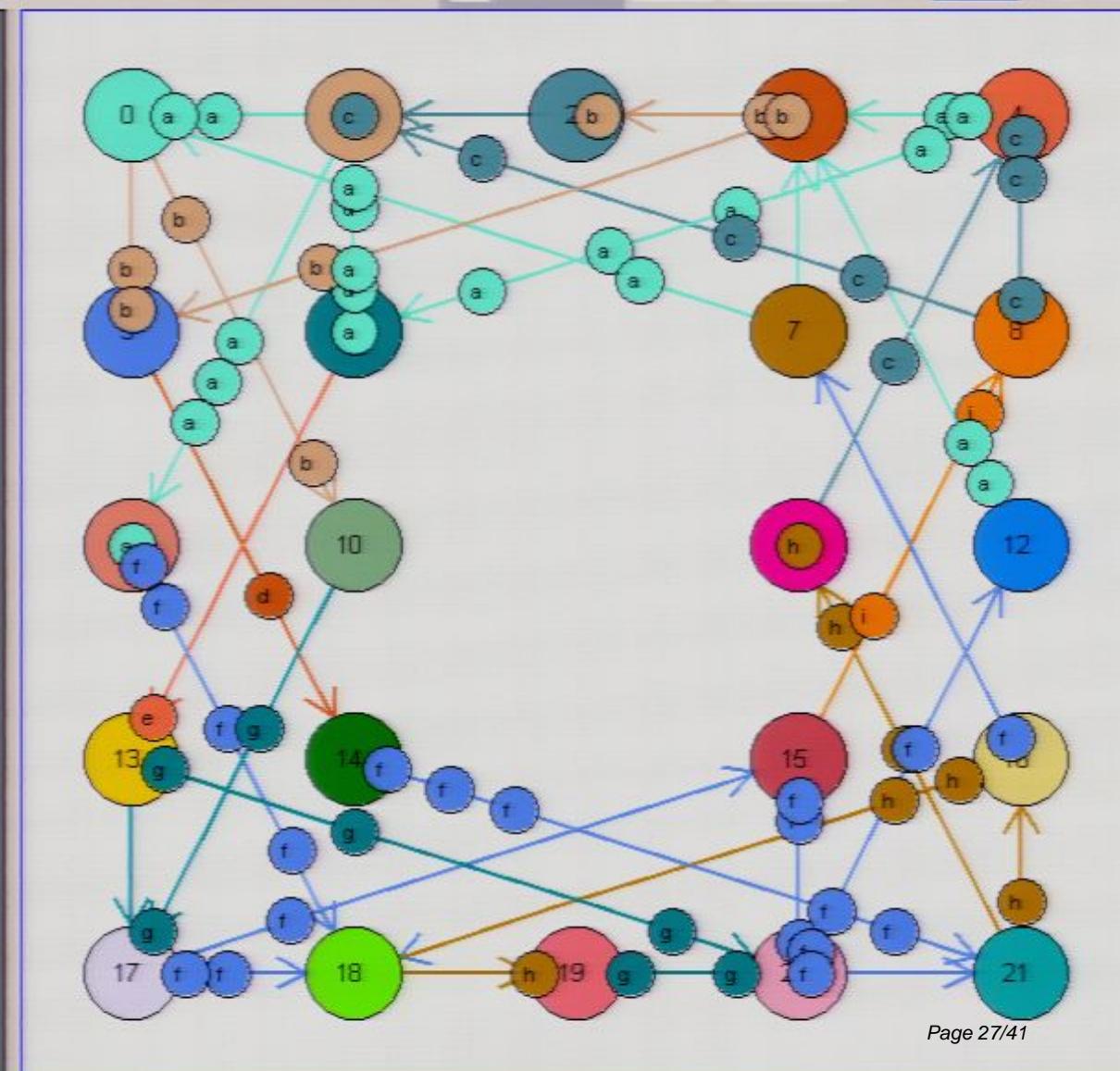
|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | accts | invis | prev  | bypass |
| none   | psort  | loops | Short | Short | wheel  |
|        | psell  |       |       |       |        |

|       |         |
|-------|---------|
| +cell | econ: 0 |
| test  |         |
| clean |         |
| proc  |         |

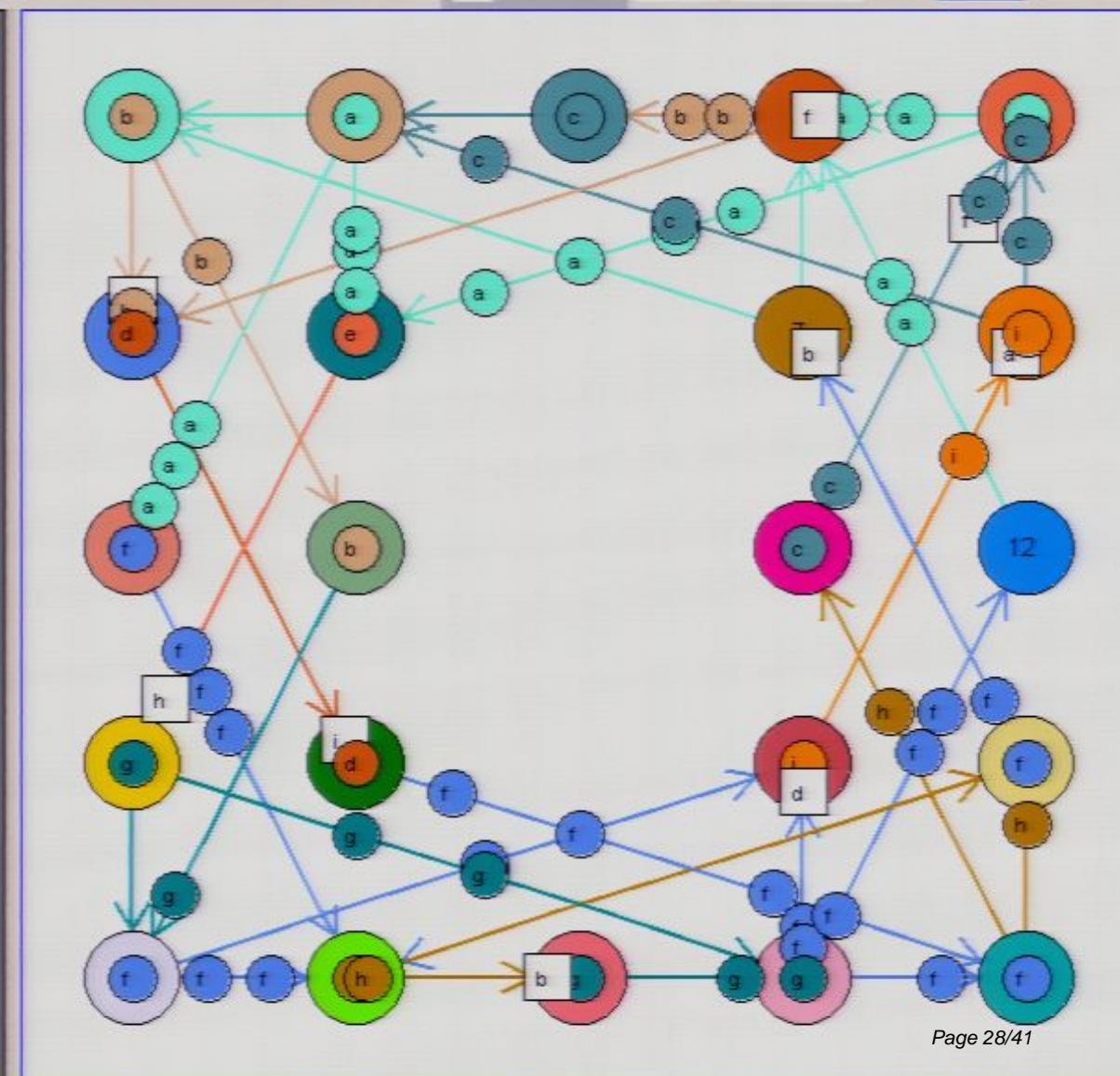
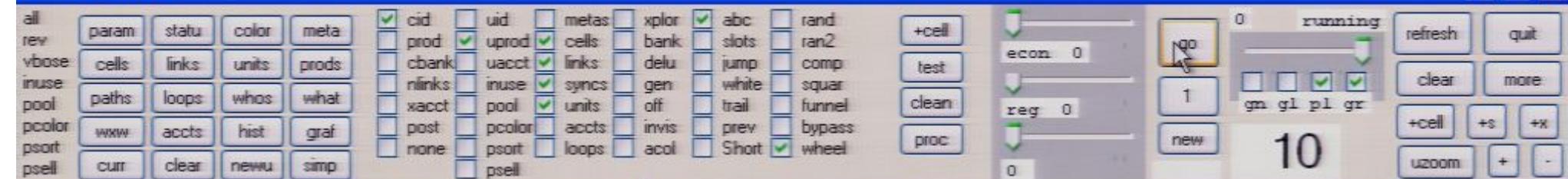
|     |       |
|-----|-------|
| 0   | ready |
| go  |       |
| 1   |       |
| new |       |

0

|         |       |
|---------|-------|
| refresh | quit  |
| clear   | more  |
| +cell   | +s +x |
| uzoom   | +     |

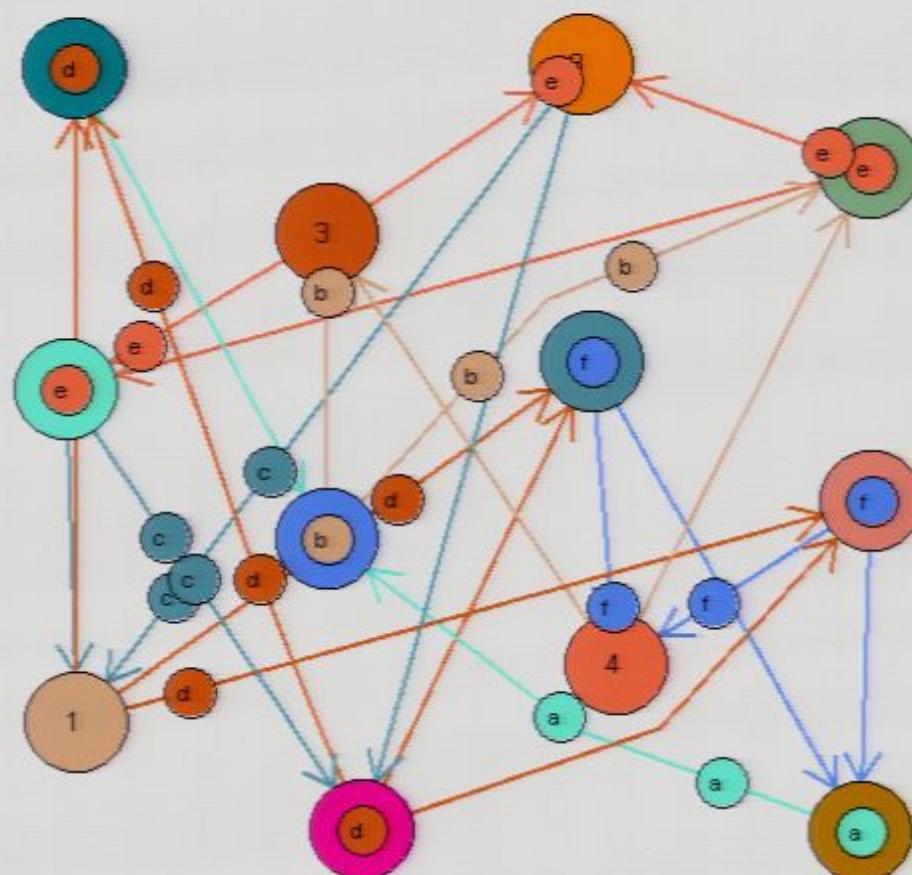


rtecon 09.04.02



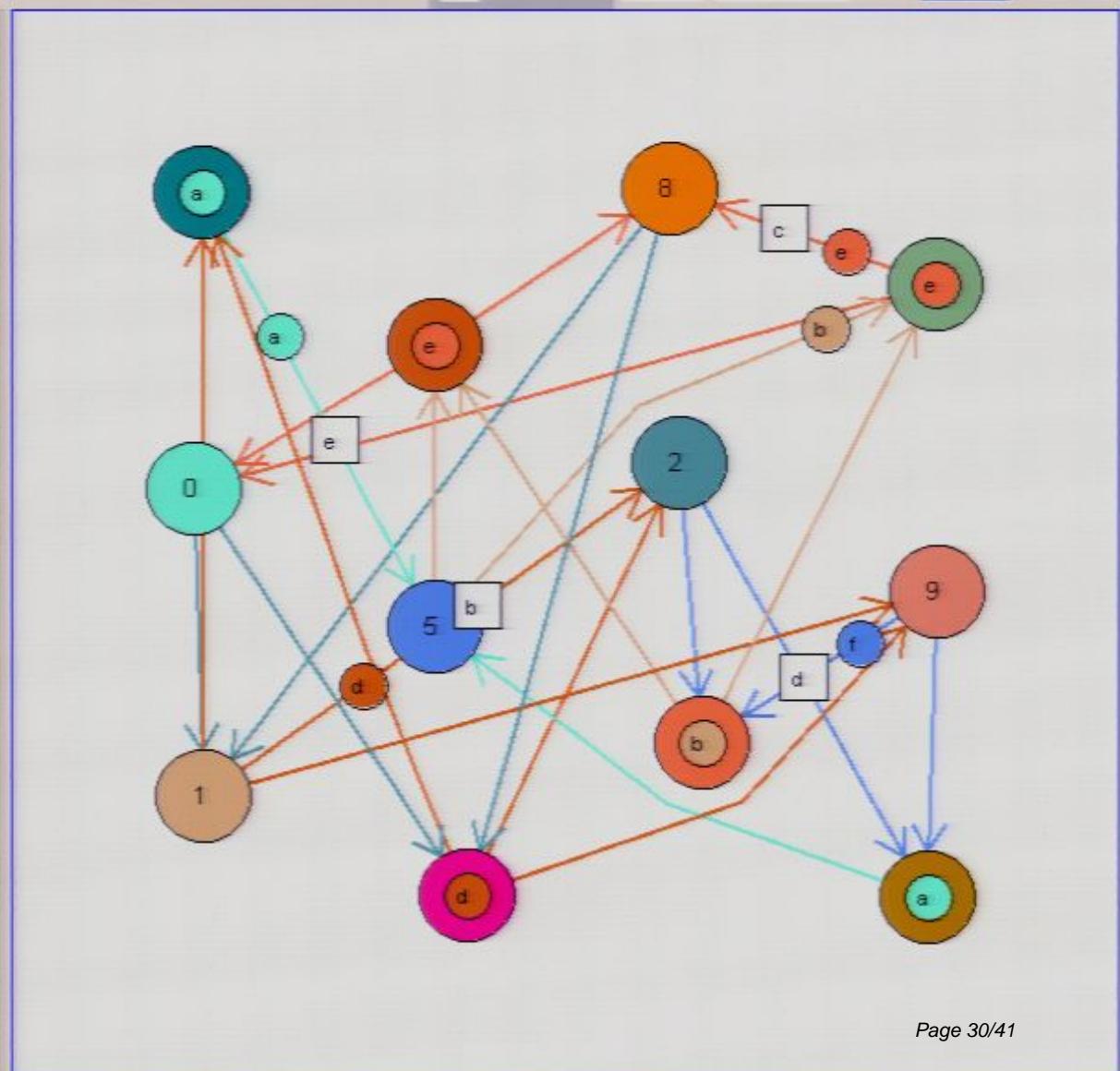
rtecon 09.04.02

|        |        |        |       |      |   |   |   |                                |   |  |                                |                              |                                |                                  |                               |
|--------|--------|--------|-------|------|---|---|---|--------------------------------|---|--|--------------------------------|------------------------------|--------------------------------|----------------------------------|-------------------------------|
| all    | param  | status | color | meta | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input checked="" type="checkbox"/> metas | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input checked="" type="checkbox"/> rand | <input type="checkbox"/> +cell | 0                            | paused                         | <input type="checkbox"/> refresh | <input type="checkbox"/> quit |
| rev    | prod   | uprod  | cells | meta | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2            | <input type="checkbox"/> test  | 1                            | <input type="checkbox"/> clear | <input type="checkbox"/> more    |                               |
| vbose  | links  | units  | prods |      | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp            | <input type="checkbox"/> clean | <input type="checkbox"/> new | <input type="checkbox"/> +cell | <input type="checkbox"/> +s      | <input type="checkbox"/> +x   |
| inuse  | rlinks | whos   | what  |      | <input type="checkbox"/> rlinks         | <input type="checkbox"/> inuse            | <input type="checkbox"/> syncs            | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input type="checkbox"/> square          | <input type="checkbox"/> proc  | 56                           | <input type="checkbox"/> uzoom | <input type="checkbox"/> +       | <input type="checkbox"/> -    |
| pool   | xacct  | hist   | graf  |      | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel          |                                |                              |                                |                                  |                               |
| pcolor | accts  | hist   | graf  |      | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass          |                                |                              |                                |                                  |                               |
| www    | curr   | clear  | newu  | simp | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel           |                                |                              |                                |                                  |                               |
| psort  | psell  |        |       |      | <input type="checkbox"/> psell          | <input type="checkbox"/> psell            |   |                                |   |  |                                |                              |                                |                                  |                               |



rtecon 09.04.02

|        |       |        |       |        |       |       |       |       |       |        |       |     |        |         |      |    |
|--------|-------|--------|-------|--------|-------|-------|-------|-------|-------|--------|-------|-----|--------|---------|------|----|
| all    | param | status | color | meta   | cid   | uid   | metas | xplor | abc   | rand   | +cell | 0   | paused | refresh | quit |    |
| rev    | prod  | uprod  | cells | metas  | cbank | uacct | links | bank  | slots | ran2   | test  | 1   | gm     | clear   | more |    |
| vbose  | links | units  | prods | ridges | inuse | syncs | delu  | jump  | comp  | square | clean | new | gl     | +cell   | +s   | +x |
| inuse  | loops | whos   | what  | xacct  | pool  | units | gen   | white | off   | funnel | proc  | 0   | pl     | uzoom   | +    | -  |
| pool   | post  | pcolor | graf  | post   | psort | accts | invis | trail | prev  | bypass |       |     | gr     |         |      |    |
| pcolor | www   | accts  | hist  | none   | psort | loops | acol  | Short | Short | wheel  |       |     |        |         |      |    |
| psort  | curr  | clear  | newu  | psell  | psell |       |       |       |       |        |       |     |        |         |      |    |



|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  |       |        |       |       |
| inuse  | cells | links  | units | prods |
| pool   | paths | loops  | whos  | what  |
| pcolor | wwx   | acct   | hist  | graf  |
| psort  |       |        |       |       |
| psell  | curr  | clear  | newu  | simp  |

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | acct  | invis | prev  | bypass |
| none   | psort  | loops | acol  | Short | wheel  |
|        | psell  | psell |       |       |        |

+cell

test

clean

proc

econ 0  
reg 0

go

1

new

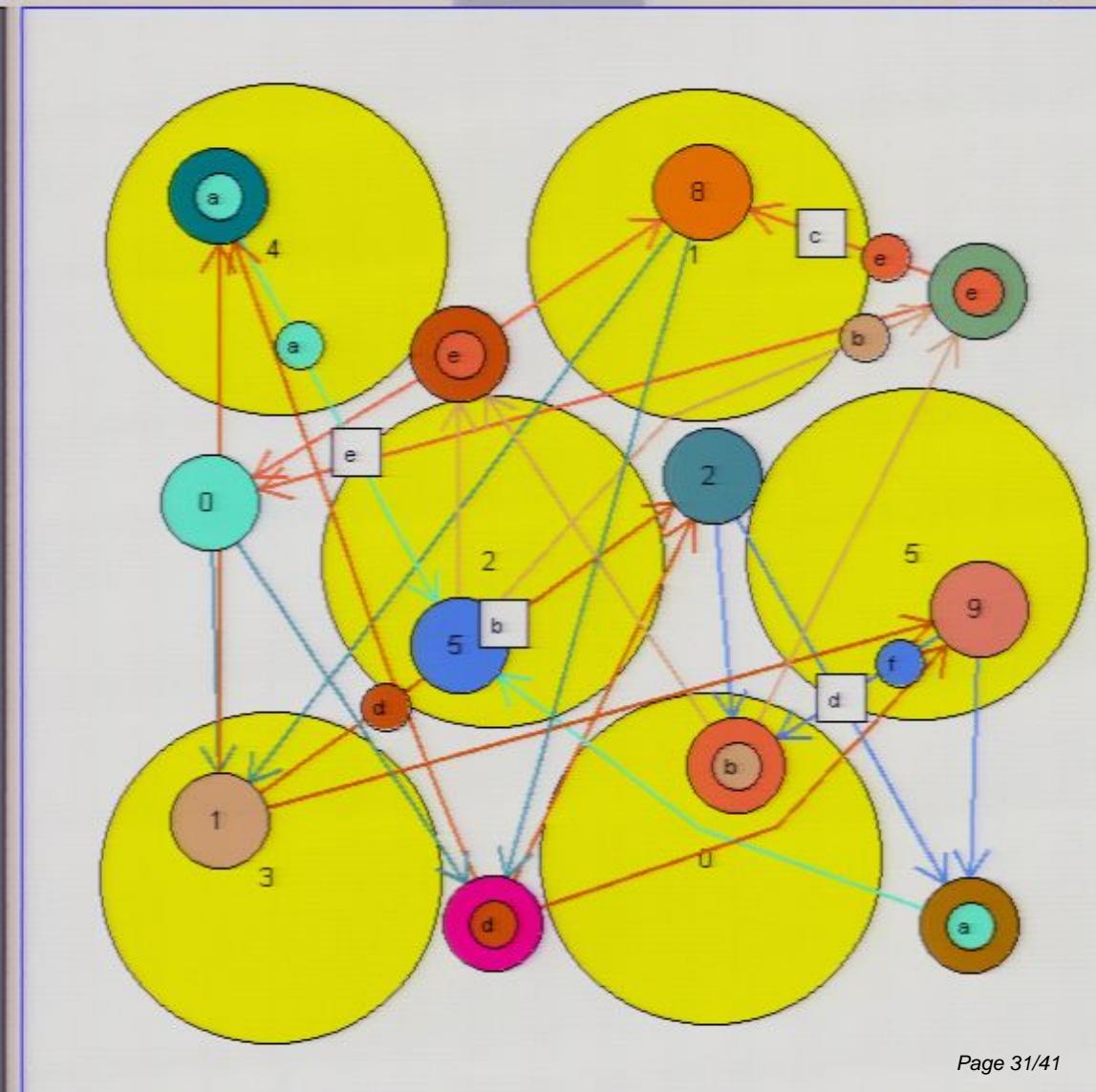
0 paused

1

0

|         |      |
|---------|------|
| refresh | quit |
| clear   | more |
| +cell   | +s   |
| uzoom   | +    |

10



## rtecon 09.04.02

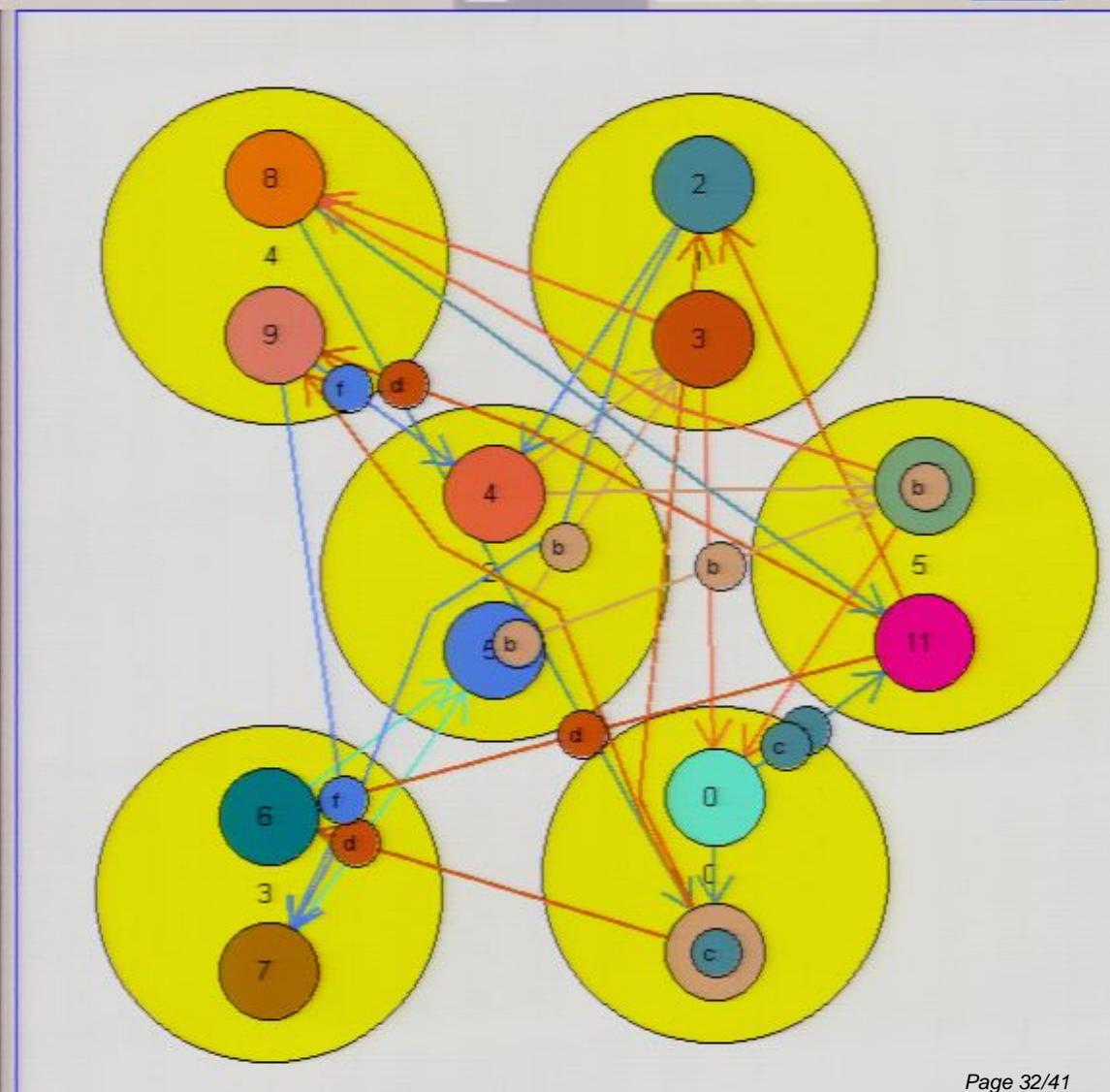
|        |       |        |       |       |  |   |   |       |   |  |       |    |       |         |
|--------|-------|--------|-------|-------|--|---|---|-------|---|--|-------|----|-------|---------|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid  | <input type="checkbox"/> uid              | <input checked="" type="checkbox"/> metas | xplor | <input checked="" type="checkbox"/> abc | <input checked="" type="checkbox"/> rand | +cell | 0  | ready | refresh |
| rev    |       |        |       |       | <input checked="" type="checkbox"/> prod | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2            |       | go | 1     | clear   |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank           | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp            | test  |    |       | more    |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rlinks          | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | gen   | <input type="checkbox"/> white          | <input type="checkbox"/> square          | clean |    |       |         |
| pool   |       |        |       |       | <input type="checkbox"/> xacct           | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel          | proc  |    |       |         |
| pcolor | wwx   | acct   | hist  | graf  | <input type="checkbox"/> post            | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass          |       |    |       |         |
| psort  |       |        |       |       | <input type="checkbox"/> none            | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel           |       |    |       |         |
| psell  | curr  | clear  | newu  | simp  | <input type="checkbox"/> psell           | <input type="checkbox"/> psell            |   |       |   |  |       |    |       |         |

+new 0

0

gm gl pl gr

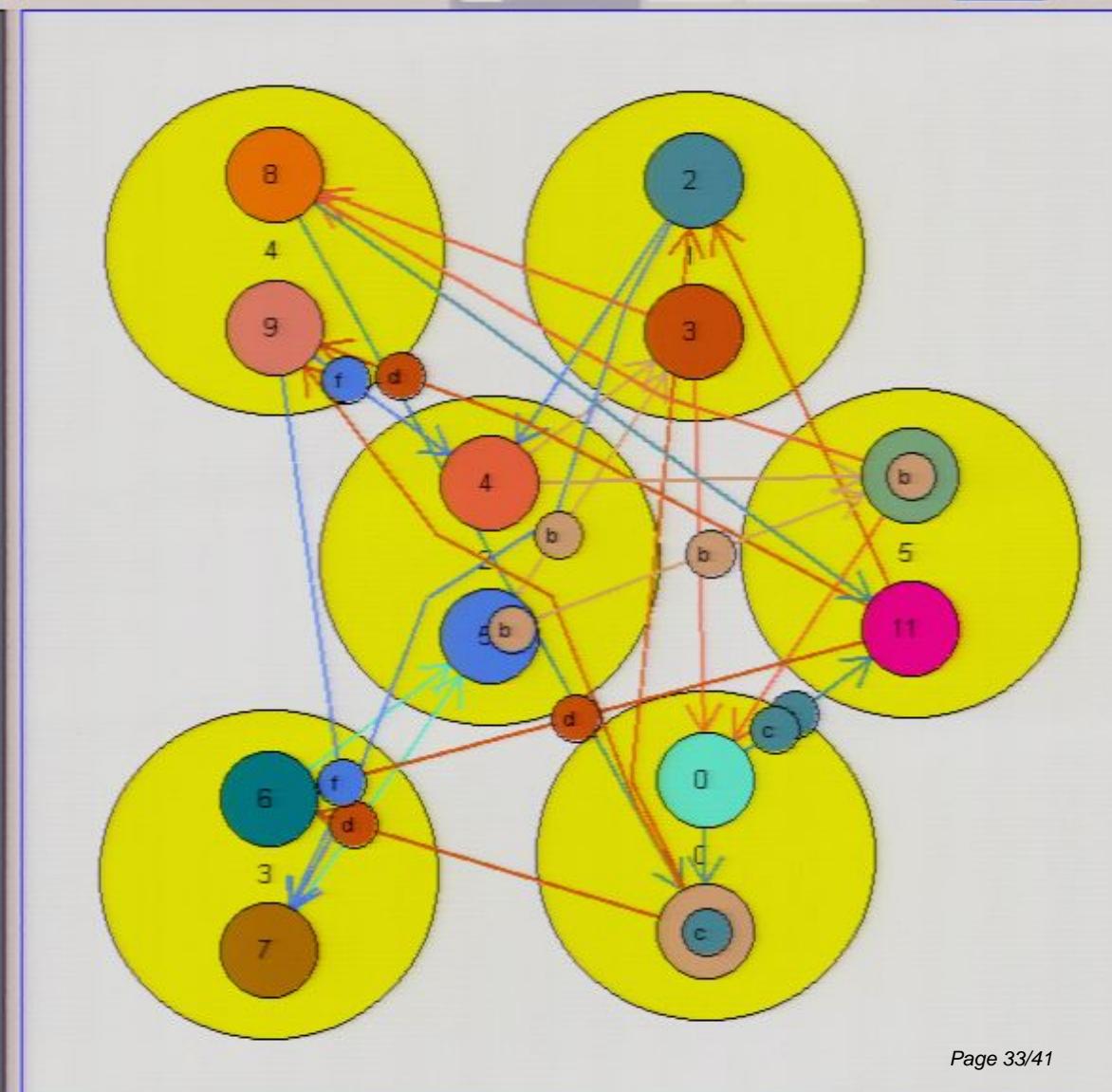
refresh quit  
clear more  
+cell +s +x  
uzoom + -



## rtecon 09.04.02

|        |       |        |       |       |   |   |   |                                |   |  |                                |        |       |                             |                                  |                               |
|--------|-------|--------|-------|-------|---|---|---|--------------------------------|---|--|--------------------------------|--------|-------|-----------------------------|----------------------------------|-------------------------------|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input checked="" type="checkbox"/> metas | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input checked="" type="checkbox"/> rand | <input type="checkbox"/> +cell | 0      | ready | <input type="checkbox"/> go | <input type="checkbox"/> refresh | <input type="checkbox"/> quit |
| rev    |       |        |       |       | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2            |                                | econ 0 |       |                             |                                  |                               |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp            |                                | test   |       |                             |                                  |                               |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rilinks        | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input type="checkbox"/> square          |                                | clean  |       |                             |                                  |                               |
| pool   |       |        |       |       | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel          |                                | proc   |       |                             |                                  |                               |
| pcolor | wwx   | accts  | hist  | graf  | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input checked="" type="checkbox"/> accts | <input type="checkbox"/> invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass          |                                |        |       |                             |                                  |                               |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel           |                                |        |       |                             |                                  |                               |
| pspell | curr  | clear  | newu  | simpl | <input type="checkbox"/> psell          | <input type="checkbox"/> psell            |   |                                |   |  |                                |        |       |                             |                                  |                               |

+cell    +s    +x  
uzoom    +    -



## rtecon 09.04.02

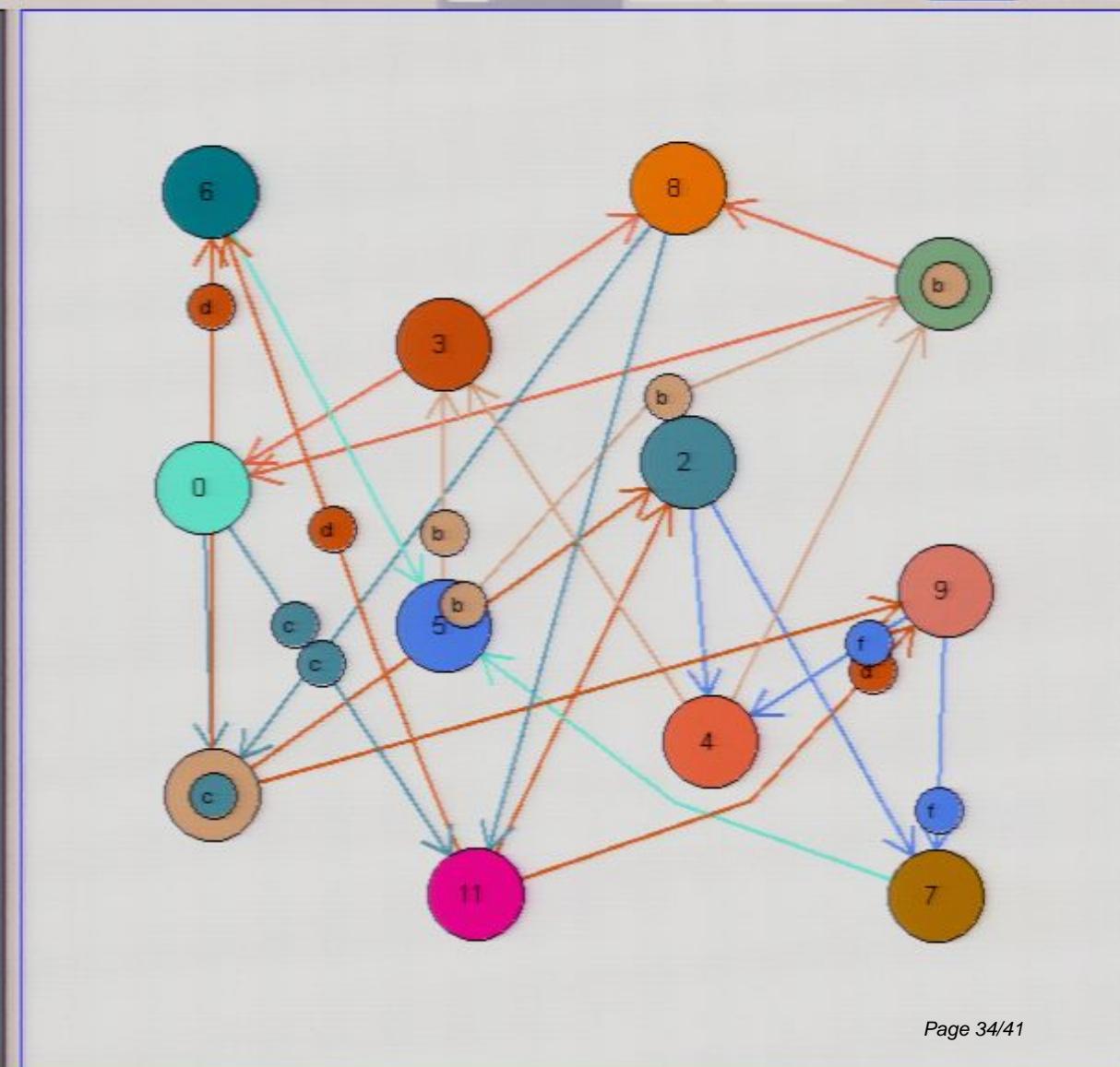
|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  | paths | loops  | whos  | what  |
| pool   | wwx   | acct   | hist  | graf  |
| pcolor |       |        |       |       |
| psort  | curr  | clear  | newu  | simp  |
| psell  |       |        |       |       |

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | acct  | invis | prev  | bypass |
| none   | psort  | loops | acol  | Short | wheel  |
|        | psell  | psell |       |       |        |

|       |      |       |
|-------|------|-------|
| +cell | 0    | ready |
| test  | econ | 0     |
| clean | reg  | 0     |
| proc  |      |       |

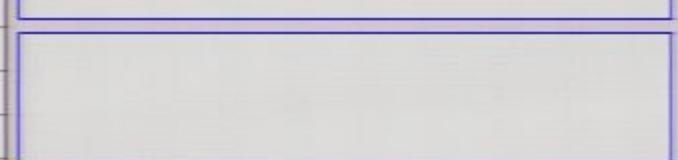
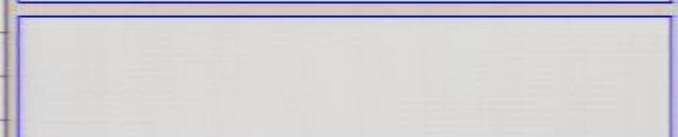
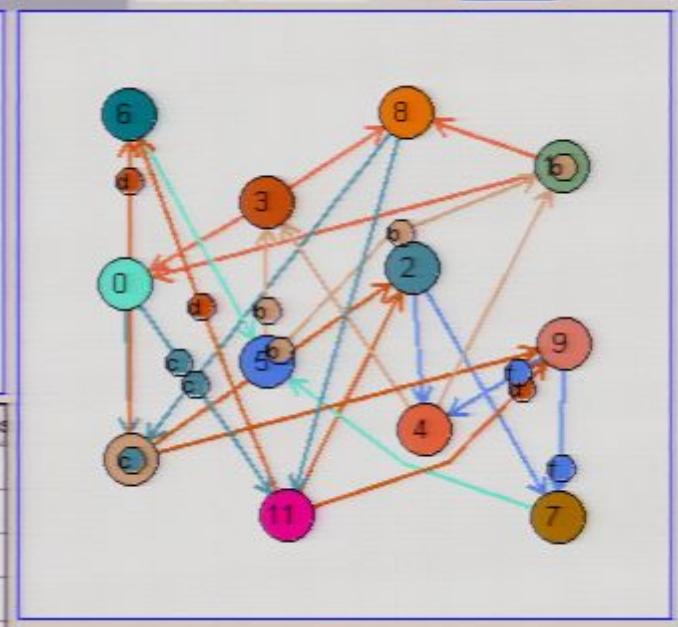
|     |    |       |
|-----|----|-------|
| go  | 0  | ready |
| 1   | gm | gl    |
| new | pl | gr    |
|     | 0  |       |

|         |      |
|---------|------|
| refresh | quit |
| clear   | more |
| +cell   | +s   |
| uzoom   | +    |
|         | -    |



|        |        |        |       |       |       |       |       |       |        |        |       |     |       |         |      |
|--------|--------|--------|-------|-------|-------|-------|-------|-------|--------|--------|-------|-----|-------|---------|------|
| all    | param  | status | color | meta  | cid   | uid   | metas | xplor | abc    | rand   | +cell | 0   | ready | refresh | quit |
| rev    | prod   | uprod  | cells | uprod | uprod | cells | bank  | slots | jump   | comp   | test  | 1   | gm    | clear   | more |
| vbose  | cbank  | uacct  | links | links | inuse | links | delu  | gen   | white  | square | clean | new | gl    | +cell   | +s   |
| inuse  | rlinks | inuse  | what  | syncs | pool  | units | off   | trail | prev   | funnel | proc  | 0   | pl    | uzoom   | +x   |
| pool   | xacct  | pool   | hist  | units | psort | accts | invis | Short | bypass | wheel  |       |     | gr    |         | -    |
| pcolor | wxx    | accts  | graf  | psort | psort | loops | acol  | psell | Short  |        |       |     |       |         |      |
| psort  | curr   | clear  | newu  | simp  |       |       |       |       |        |        |       |     |       |         |      |

| cell | prods: | c meta | equity | profit | a equity | a cash | inven        | c can     | u status | gpos |
|------|--------|--------|--------|--------|----------|--------|--------------|-----------|----------|------|
| 0    | e → c  | 0      | 0      | 0      | -10      | 10     | 0 0          | ... buy 0 |          | 1    |
| 1    | c → d  | 0      | 0      | 0      | -10      | 9      | 1 0          | ... buy 0 | 0c arrv  | 1    |
| 2    | d → f  | 1      | 0      | 0      | -10      | 10     | 0 0          | ... buy 0 |          | 1    |
| 3    | b → e  | 1      | 0      | 0      | -10      | 9      | 1 0          | ... buy 0 |          | 1    |
| 4    | f → b  | 2      | 0      | 0      | -10      | 9      | 1 0          | ... buy 0 |          | 1    |
| 5    | a → b  | 2      | 0      | 0      | -10      | 10     | 0 0          | ... buy 0 |          | 1    |
| 6    | d → a  | 3      | 0      | 0      | -10      | 8      | 2 0          | ... buy 0 |          | 1    |
| 7    | f → a  | 3      | 0      | 0      | -10      | 9      | 1 0          | ... buy 0 |          | 1    |
| 8    | e → c  | 4      | 0      | 0      | -10      | 10     | 0 0          | ... buy 0 |          | 1    |
| 9    | d → f  | 4      | 0      | 0      | -10      | 9      | 1 0          | ... buy 0 |          | 1    |
| 10   | b → e  | 5      | 0      | 0      | -10      | 7      | 3 0          | ... buy 0 | 6b arrv  | 1    |
| 11   | c → d  | 5      | 0      | 0      | -10      | 8      | 2 0          | ... buy 0 |          | 1    |
|      |        |        |        |        |          |        | averages-> 1 |           |          |      |



retecon 09.04.02



|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  |       |        |       |       |
| pool   | paths | loops  | whos  | what  |
| pcolor | wwx   | accts  | hist  | graf  |
| psort  |       |        |       |       |
| pseal  | curr  | clear  | newu  | simp  |

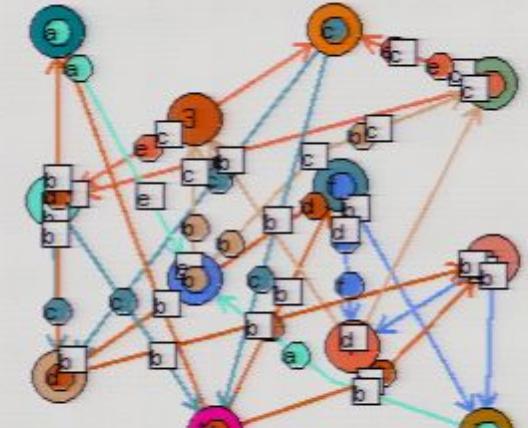
|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | accts | invis | prev  | bypass |
| none   | psort  | loops | acol  | Short | wheel  |
|        | psell  | psell |       |       |        |

|       |   |      |   |
|-------|---|------|---|
| +cell | 0 | econ | 0 |
| test  |   |      |   |
| clean |   |      |   |
| proc  |   |      |   |

|     |   |     |   |
|-----|---|-----|---|
| go  | 1 | reg | 0 |
| new |   |     | 0 |

54

|         |      |
|---------|------|
| refresh | quit |
| clear   | more |
| +cell   | +s   |
| uzoom   | +    |
|         | -    |



| cell | prods: | c meta | equity | profit       | a equity | a cash | inven | c can        | u status |
|------|--------|--------|--------|--------------|----------|--------|-------|--------------|----------|
| 0    | e->c   | 0      | 0      | 0.004803446  | -10      | 10.01  | 0 0   | .b.. buy 9   |          |
| 1    | c->d   | 0      | 0.01   | -0.009950495 | -9.99    | 9.01   | 0 1   | ...s sell 7  | 47d sell |
| 2    | d->f   | 1      | 0      | 0            | -10      | 9.01   | 0 1   | ...s. sell 3 | 50f sell |
| 3    | b->e   | 1      | 0.01   | -0.01470395  | -9.99    | 9      | 1 0   | ... wait 9   |          |
| 4    | f->b   | 2      | 0.01   | -0.009851975 | -9.99    | 7.99   | 2 0   | b.. wait 9   |          |
| 5    | a->b   | 2      | 0.05   | -0.03495296  | -9.97    | 8.99   | 0 1   | ... sell 3   | 53b sell |
| 6    | d->a   | 3      | 0.01   | -0.009851485 | -9.99    | 9      | 0 1   | ... sell 5   | 17a sell |
| 7    | f->a   | 3      | 0.02   | -0.01480247  | -9.99    | 8.99   | 1 0   | ... wait 4   | 31a sold |
| 8    | e->c   | 4      | 0.02   | -0.01995148  | -9.98    | 9.01   | 0 1   | ... sell 8   | 49c sell |
| 9    | d->f   | 4      | 0      | -0.004950495 | -10      | 9      | 1 0   | bb.. wait 14 |          |
| 10   | b->e   | 5      | 0.05   | -0.03940741  | -9.96    | 8.99   | 0 1   | ...s. sell 0 | 5e sell  |
| 11   | c->d   | 5      | -0.01  | 4.950495E-05 | -10      | 9.01   | 0 1   | ...s sell 3  | 15d sell |

averages-&gt; 1



rtecon 09.04.02



|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  |       |        |       |       |
| pool   | paths | loops  | whos  | what  |
| pcolor | wwx   | acct   | hist  | graf  |
| psort  |       |        |       |       |
| psell  | curr  | clear  | newu  | simpl |

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | acct  | invis | prev  | bypass |
| none   | psort  | loops | acol  | Short | wheel  |
|        | psell  | psell |       |       |        |

|       |        |
|-------|--------|
| +cell | econ 0 |
| test  |        |
| clean |        |
| proc  |        |
| 0     |        |

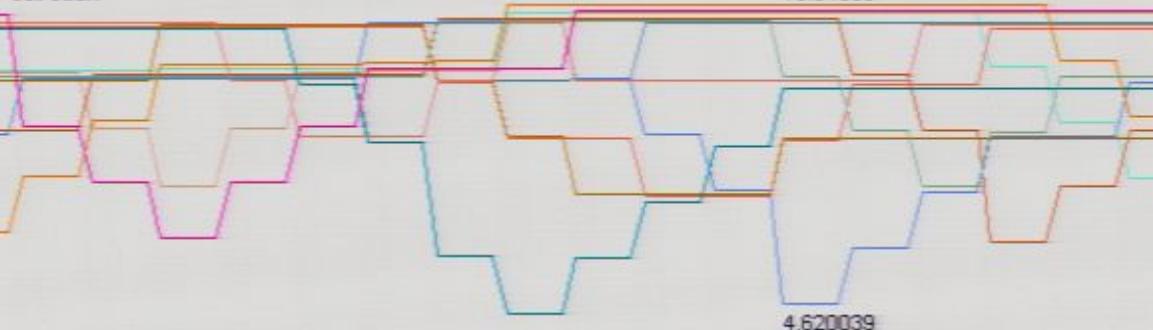
|     |
|-----|
| go  |
| 1   |
| new |
| 0   |

|    |         |
|----|---------|
| 0  | running |
| 1  | refresh |
| 2  | quit    |
| 3  | clear   |
| 4  | more    |
| 5  | +cell   |
| 6  | +s      |
| 7  | +x      |
| 8  | uzoom   |
| 9  | +       |
| 10 | -       |

423

cell cash

10.34009



| graf | system | variable | plot | filter | num | values |
|------|--------|----------|------|--------|-----|--------|
|------|--------|----------|------|--------|-----|--------|

|   |  |  |     |  |  |  |
|---|--|--|-----|--|--|--|
| 0 |  |  | map |  |  |  |
|---|--|--|-----|--|--|--|

|   |      |      |      |        |    |   |
|---|------|------|------|--------|----|---|
| 1 | edit | cell | cash | timser | 12 | 10.09536 8.041493 8.964439 10.02851 8.90178 7.89773 |
|---|------|------|------|--------|----|---|

|   |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| 2 |  |  |  |  |  |  |
|---|--|--|--|--|--|--|

|   |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| 3 |  |  |  |  |  |  |
|---|--|--|--|--|--|--|

|   |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| 4 |  |  |  |  |  |  |
|---|--|--|--|--|--|--|

|   |      |      |      |      |  |  |
|---|------|------|------|------|--|--|
| 0 | none | none | none | none |  |  |
|---|------|------|------|------|--|--|

|   |      |      |     |      |  |  |
|---|------|------|-----|------|--|--|
| 1 | meta | cash | map | diff |  |  |
|---|------|------|-----|------|--|--|

|   |      |       |     |      |  |  |
|---|------|-------|-----|------|--|--|
| 2 | cell | prfit | air | intg |  |  |
|---|------|-------|-----|------|--|--|

|   |      |       |      |     |  |  |
|---|------|-------|------|-----|--|--|
| 3 | celq | equit | grid | smo |  |  |
|---|------|-------|------|-----|--|--|

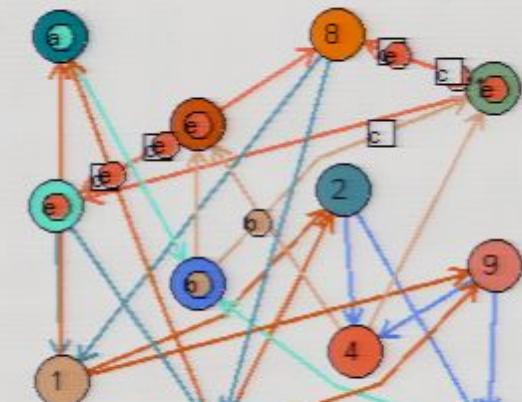
|   |      |      |     |     |  |  |
|---|------|------|-----|-----|--|--|
| 4 | link | heat | bar | avg |  |  |
|---|------|------|-----|-----|--|--|

|      |      |         |     |  |  |  |
|------|------|---------|-----|--|--|--|
| unit | span | barsort | log |  |  |  |
|------|------|---------|-----|--|--|--|

|      |       |        |       |  |  |  |
|------|-------|--------|-------|--|--|--|
| loop | spand | timser | log10 |  |  |  |
|------|-------|--------|-------|--|--|--|

|      |        |      |       |  |  |  |
|------|--------|------|-------|--|--|--|
| prod | ginven | bars | round |  |  |  |
|------|--------|------|-------|--|--|--|

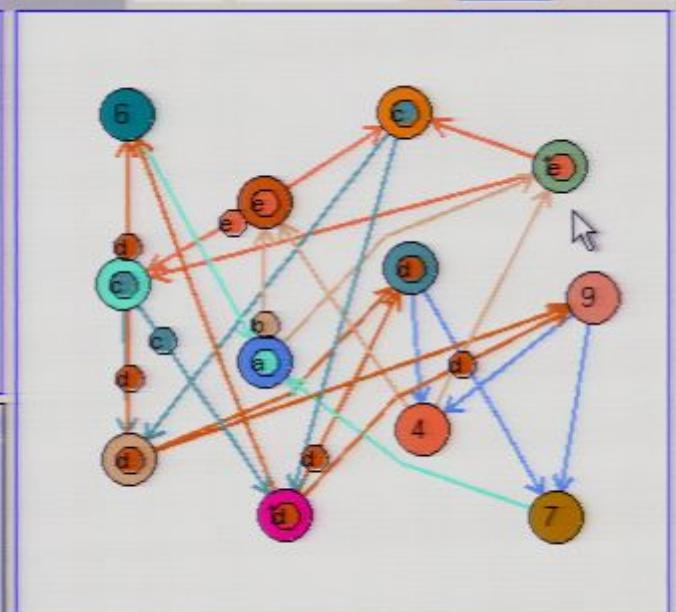
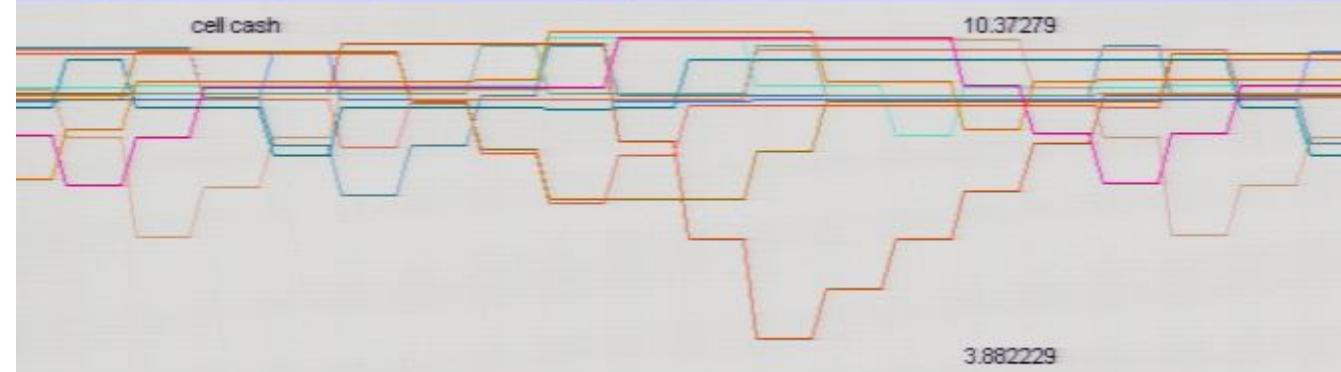
|     |        |      |  |  |  |  |
|-----|--------|------|--|--|--|--|
| air | pinven | size |  |  |  |  |
|-----|--------|------|--|--|--|--|



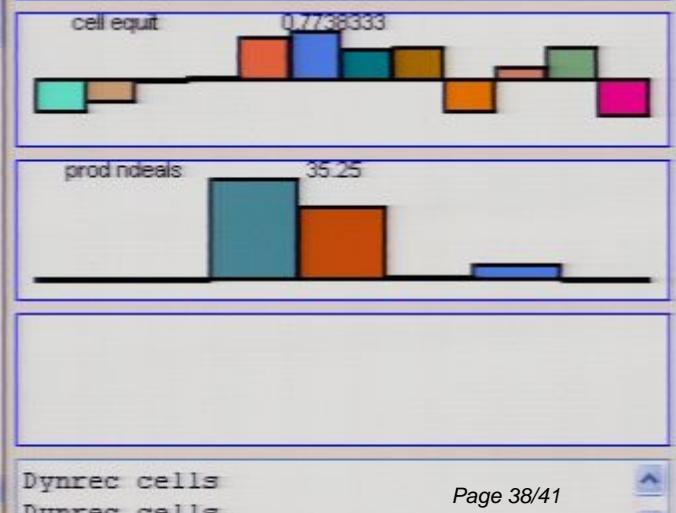
rtecon 09.04.02



|        |       |        |       |       |   |   |   |                                |   |  |                                |                               |   |                              |   |        |                                  |                               |                             |
|--------|-------|--------|-------|-------|---|---|---|--------------------------------|---|--|--------------------------------|-------------------------------|---|------------------------------|---|--------|----------------------------------|-------------------------------|-----------------------------|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input type="checkbox"/> xplor | <input checked="" type="checkbox"/> abc | <input checked="" type="checkbox"/> rand | <input type="checkbox"/> +cell | <input type="checkbox"/> econ | 0 | <input type="checkbox"/> go  | 0 | paused | <input type="checkbox"/> refresh | <input type="checkbox"/> quit |                             |
| rev    |       |        |       |       | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2            |                                |                               |   | <input type="checkbox"/> 1   |   |        | <input type="checkbox"/> clear   | <input type="checkbox"/> more |                             |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp            |                                |                               |   | <input type="checkbox"/> new |   |        | <input type="checkbox"/> +cell   | <input type="checkbox"/> +s   | <input type="checkbox"/> +x |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rilinks        | <input type="checkbox"/> inuse            | <input type="checkbox"/> syncs            | <input type="checkbox"/> gen   | <input type="checkbox"/> white          | <input type="checkbox"/> squar           |                                |                               |   |                              |   |        | <input type="checkbox"/> uzoom   | <input type="checkbox"/> +    | <input type="checkbox"/> -  |
| pool   |       |        |       |       | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel          |                                |                               |   |                              |   |        |                                  |                               |                             |
| pcolor | www   | acct   | hist  | graf  | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass          |                                |                               |   |                              |   |        |                                  |                               |                             |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input type="checkbox"/> loops            | <input type="checkbox"/> acol  | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel           |                                |                               |   |                              |   |        |                                  |                               |                             |
| psell  |       |        |       |       | <input type="checkbox"/> curr           | <input type="checkbox"/> clear            | <input type="checkbox"/> newu             | <input type="checkbox"/> psell |   |  |                                |                               |   |                              |   |        |                                  |                               |                             |



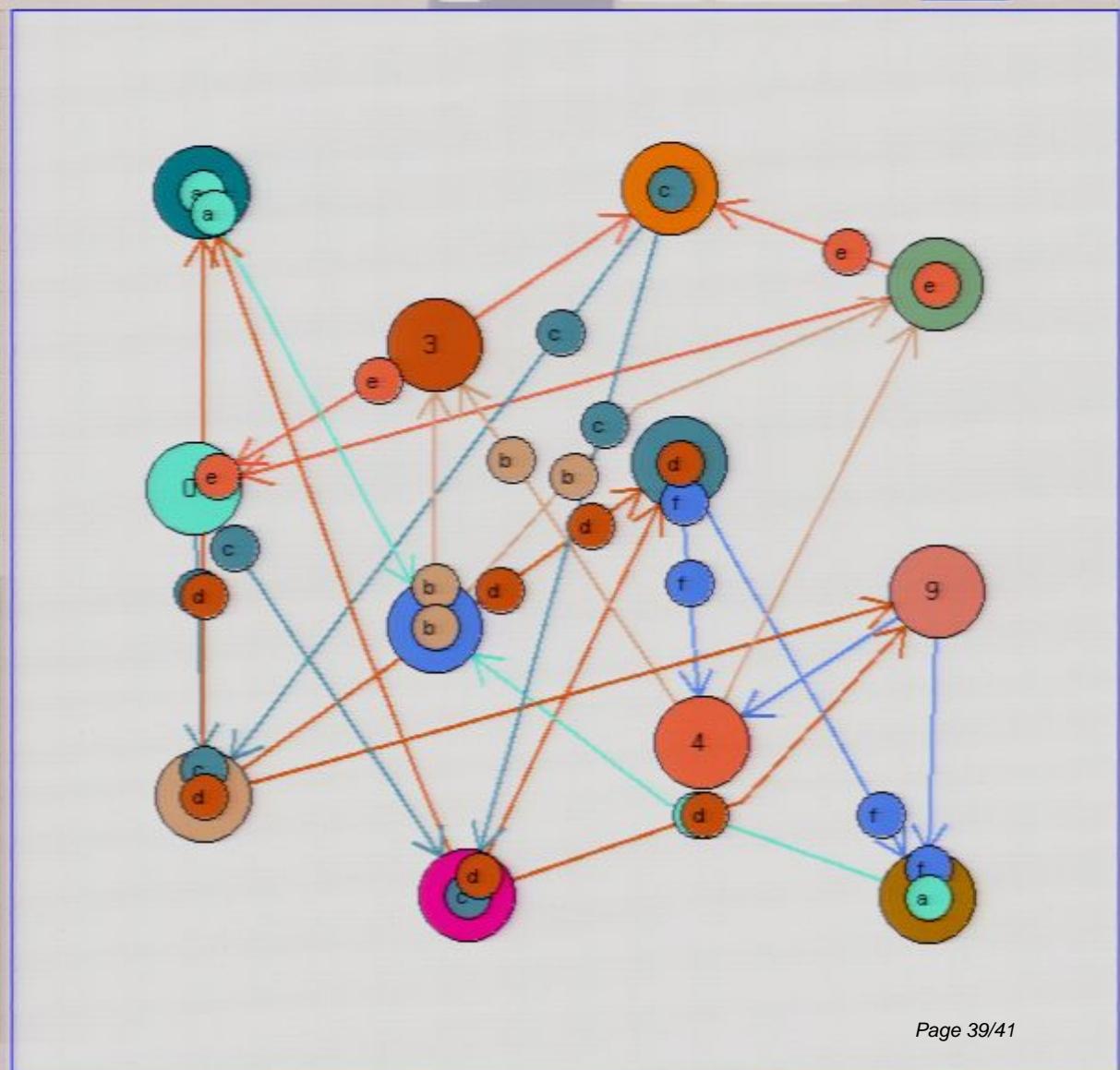
| graf | system | variable | plot    | filter | num | values  |
|------|--------|----------|---------|--------|-----|---|
| 0    |        |          | map     |        |     |   |
| 1    | cell   | cash     | timser  |        | 12  | 9.194498 8.114321 8.003162 8.98808 9.746742 9.91538 |
| 2    | cell   | equit    | bar     |        | 12  | -0.5216965 -0.3704188 0.003359933 0.05056677 0.6854 |
| 3    | edit   | prod     | ndeals  | bar    | 7   | 0 0.08333334 35.25 25.41667 0.9166667 5.5 0.1666667 |
| 4    |        |          |         |        |     |   |
| 0    | none   | none     | none    | none   |     |   |
| 1    | meta   | ndeals   | map     | diff   |     |   |
| 2    | cell   | prod1    | air     | intg   |     |   |
| 3    | celq   | prod2    | grid    | smo    |     |   |
| 4    | link   | prod3    | bar     | avg    |     |   |
|      | unit   |          | barsort | log    |     |   |
|      | loop   |          | timser  | log10  |     |   |
|      | prod   |          | bars    | round  |     |   |
|      | air    |          | size    |        |     |   |



## rtecon 09.04.02

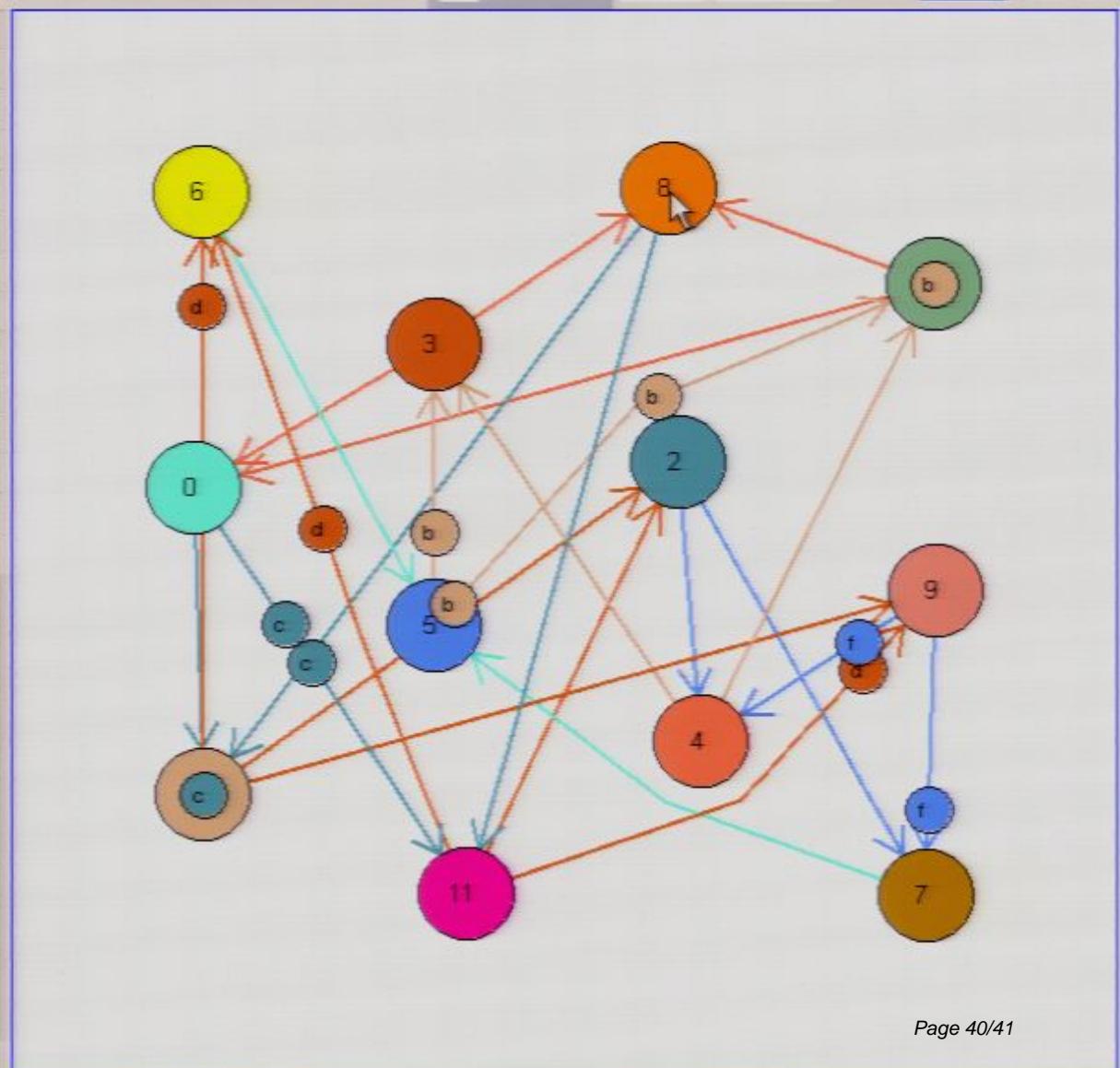
|        |       |        |       |       |   |   |   |       |   |  |       |        |        |         |      |  |
|--------|-------|--------|-------|-------|---|---|---|-------|---|--|-------|--------|--------|---------|------|--|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input checked="" type="checkbox"/> metas | xplor | <input checked="" type="checkbox"/> abc | <input checked="" type="checkbox"/> rand | +cell | 0      | paused | refresh | quit |  |
| rev    |       |        |       |       | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | bank  | <input type="checkbox"/> slots          | <input type="checkbox"/> ran2            | test  | econ 0 |        |         |      |  |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | delu  | <input type="checkbox"/> jump           | <input type="checkbox"/> comp            | clean | reg 0  |        |         |      |  |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rilinks        | <input type="checkbox"/> inuse            | <input type="checkbox"/> syncs            | gen   | <input type="checkbox"/> white          | <input type="checkbox"/> square          | proc  |        |        |         |      |  |
| pool   |       |        |       |       | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | off   | <input type="checkbox"/> trail          | <input type="checkbox"/> funnel          |       |        |        |         |      |  |
| pcolor | www   | acct   | hist  | graf  | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | invis | <input type="checkbox"/> prev           | <input type="checkbox"/> bypass          |       |        |        |         |      |  |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input checked="" type="checkbox"/> loops | Short | <input type="checkbox"/> Short          | <input type="checkbox"/> wheel           |       |        |        |         |      |  |
| psell  | curr  | clear  | newu  | simpl | <input type="checkbox"/> psell          | <input type="checkbox"/> psell            | <input type="checkbox"/> acol             |       |   |  |       |        |        |         |      |  |

| none | acct | cash   | rawmat | fingoods | reven  |
|------|------|--------|--------|----------|--------|
| 0    | 0    | 10.015 | -0.02  | 0.01     | -3.985 |
| 0    | 1    | 9.01   | -0.012 | 0.992    | -3.99  |
| 0    | 2    | 9.01   | 0.99   | 0        | -3     |
| 0    | 3    | 9.005  | 0.99   | -0.01    | -3.985 |
| 0    | 4    | 7.99   | 2      | 0        | -1.99  |
| 0    | 5    | 8.985  | 1.007  | -0.027   | -3.965 |
| 0    | 6    | 8.995  | 0.006  | 0.989    | -2.995 |
| 0    | 7    | 8.99   | 1      | -0.005   | -1.985 |
| 0    | 8    | 9.015  | -0.012 | 0.978    | -2.99  |
| 0    | 9    | 8.995  | 1      | 0        | -1.995 |
| 0    | 10   | 8.985  | 0.997  | -0.022   | -3.961 |
| 0    | 11   | 9.005  | 0.995  | 0        | -4     |



|        |       |        |       |       |   |   |   |   |                                |  |   |       |                                  |                               |       |
|--------|-------|--------|-------|-------|---|---|---|---|--------------------------------|--|---|-------|----------------------------------|-------------------------------|-------|
| all    | param | status | color | meta  | <input checked="" type="checkbox"/> cid | <input type="checkbox"/> uid              | <input type="checkbox"/> metas            | <input checked="" type="checkbox"/> xplor | <input type="checkbox"/> abc   | <input checked="" type="checkbox"/> rand | 0 | ready | <input type="checkbox"/> refresh | <input type="checkbox"/> quit |       |
| rev    |       |        |       |       | <input type="checkbox"/> prod           | <input checked="" type="checkbox"/> uprod | <input checked="" type="checkbox"/> cells | <input type="checkbox"/> bank             | <input type="checkbox"/> slots | <input type="checkbox"/> ran2            |   |       |                                  |                               |       |
| vbose  | cells | links  | units | prods | <input type="checkbox"/> cbank          | <input type="checkbox"/> uacct            | <input checked="" type="checkbox"/> links | <input type="checkbox"/> delu             | <input type="checkbox"/> jump  | <input type="checkbox"/> comp            |   | +cell | <input type="checkbox"/> econ    | <input type="checkbox"/> 0    |       |
| inuse  | paths | loops  | whos  | what  | <input type="checkbox"/> rilinks        | <input type="checkbox"/> inuse            | <input checked="" type="checkbox"/> syncs | <input type="checkbox"/> gen              | <input type="checkbox"/> white | <input type="checkbox"/> square          |   | test  | <input type="checkbox"/> reg     | <input type="checkbox"/> 0    |       |
| pool   |       |        |       |       | <input type="checkbox"/> xacct          | <input type="checkbox"/> pool             | <input checked="" type="checkbox"/> units | <input type="checkbox"/> off              | <input type="checkbox"/> trail | <input type="checkbox"/> funnel          |   | clean | <input type="checkbox"/> proc    |                               |       |
| pcolor | wxx   | accts  | hist  | graf  | <input type="checkbox"/> post           | <input type="checkbox"/> pcolor           | <input type="checkbox"/> accts            | <input type="checkbox"/> invis            | <input type="checkbox"/> prev  | <input type="checkbox"/> bypass          |   |       |                                  |                               |       |
| psort  |       |        |       |       | <input type="checkbox"/> none           | <input type="checkbox"/> psort            | <input checked="" type="checkbox"/> loops | <input type="checkbox"/> Short            | <input type="checkbox"/> Short | <input type="checkbox"/> wheel           |   |       |                                  |                               |       |
| psell  | curr  | clear  | newu  | simpl |   |   |   |   |                                |  |   | go    | 1                                | new                           | 0     |
|        |       |        |       |       |   |   |   |   |                                |  |   |       |                                  |                               | 6-P-c |

| none | acct | cash | rawmat | fingoods | reven |
|------|------|------|--------|----------|-------|
| 0    | 0    | 10   | 0      | 0        | 0     |
| 0    | 1    | 9    | 1      | 0        | 0     |
| 0    | 2    | 10   | 0      | 0        | 0     |
| 0    | 3    | 9    | 1      | 0        | 0     |
| 0    | 4    | 9    | 1      | 0        | 0     |
| 0    | 5    | 10   | 0      | 0        | 0     |
| 0    | 6    | 8    | 2      | 0        | 0     |
| 0    | 7    | 9    | 1      | 0        | 0     |
| 0    | 8    | 10   | 0      | 0        | 0     |
| 0    | 9    | 9    | 1      | 0        | 0     |
| 0    | 10   | 7    | 3      | 0        | 0     |
| 0    | 11   | 8    | 2      | 0        | 0     |



retecon 09.04.02



|        |       |        |       |       |
|--------|-------|--------|-------|-------|
| all    | param | status | color | meta  |
| rev    |       |        |       |       |
| vbose  | cells | links  | units | prods |
| inuse  | paths | loops  | whos  | what  |
| pool   | wwx   | accts  | hist  | graf  |
| pcolor |       |        |       |       |
| psort  |       |        |       |       |
| psell  | curr  | clear  | newu  | simpl |

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| cid    | uid    | metas | xplor | abc   | rand   |
| prod   | uprod  | cells | bank  | slots | ran2   |
| cbank  | uacct  | links | delu  | jump  | comp   |
| rlinks | inuse  | syncs | gen   | white | square |
| xacct  | pool   | units | off   | trail | funnel |
| post   | pcolor | accts | invis | prev  | bypass |
| none   | psort  | loops | Short | Short | wheel  |
|        | psell  | psell |       |       |        |

|       |    |      |   |
|-------|----|------|---|
| +cell | go | econ | 0 |
| test  |    |      |   |
| clean |    | reg  | 0 |
| proc  |    |      |   |
|       |    |      |   |

|        |        |   |
|--------|--------|---|
| 0      | paused | 0 |
| go     |        |   |
| 1      |        |   |
| new    |        |   |
| 6-12-8 |        |   |

|         |      |
|---------|------|
| refresh | quit |
| clear   | more |
| +cell   | +s   |
| uzoom   | +    |
|         | -    |

203

| none | acct | cash   | rawmat | fingoods | reven   |
|------|------|--------|--------|----------|---------|
| 0    | 0    | 9.994  | 0.012  | -0.094   | -15.999 |
| 0    | 1    | 9.113  | 0.884  | 0.067    | -14.105 |
| 0    | 2    | 8.959  | 0.976  | -0.038   | -8.048  |
| 0    | 3    | 8.917  | 0.097  | 0.908    | -13.996 |
| 0    | 4    | 9.951  | 0.012  | -0.055   | -11.026 |
| 0    | 5    | 9.025  | -0.036 | 1.062    | -14.078 |
| 0    | 6    | 8.981  | 1.005  | -0.018   | -11.051 |
| 0    | 7    | 10.011 | -0.004 | -0.03    | -10.041 |
| 0    | 8    | 9.004  | 1.05   | 0.052    | -15.947 |
| 0    | 9    | 9.007  | 0.974  | 0.052    | -11.057 |
| 0    | 10   | 8.941  | 0.039  | 0.981    | -12.967 |
| 0    | 11   | 6.151  | 2.835  | 1.178    | -16.104 |
| 0    | 12   | 9.945  | 0.052  | -0.101   | -5.985  |

