Autonomous system Object Editor (aoe)

WeeSan Lee <wlee@isi.edu>
Cengiz Alaettinoglu <cengiz@isi.edu>

(Slides: ftp://ftp.isi.edu/rps/sanjose-ietf/aoe.ps.gz)

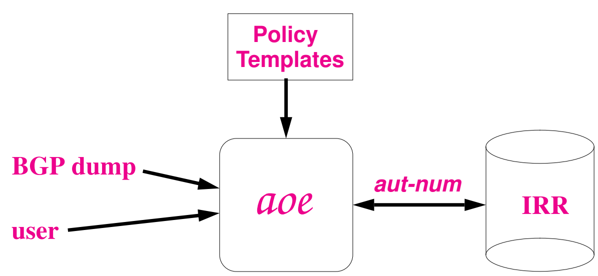
aoe features

- Generate *aut-num* objects automatically
  - neighbors
    - from IRR database
    - from BGP dump
    - manually
  - policies: *as-in, as-out*
    - from BGP dump
    - from neighbor's policy
    - from heuristics
      - our AS as a provider AS
      - our AS as a customer AS
      - our AS as a peer AS
      - our AS as a transit AS

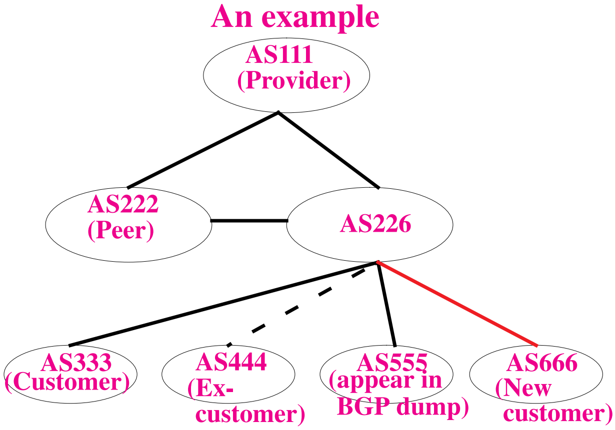
aoe features (cont')

- User friendly interface
  - GUI
  - "on-line" help
  - easy to update IRR

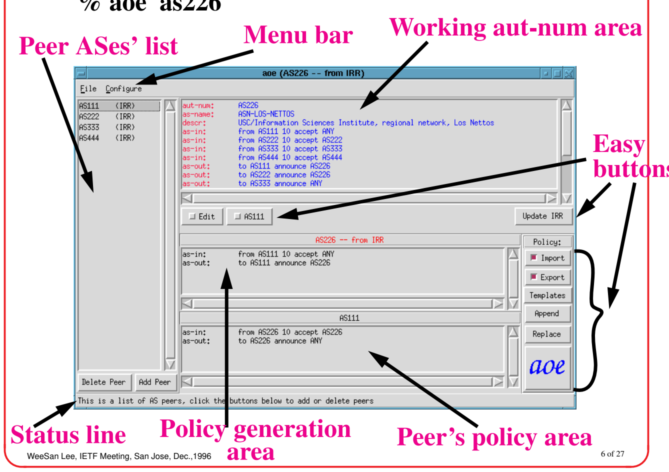
aoe's working model

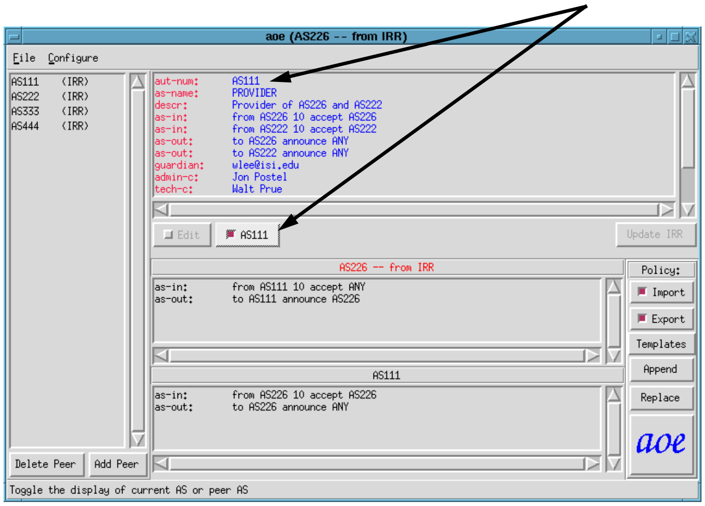


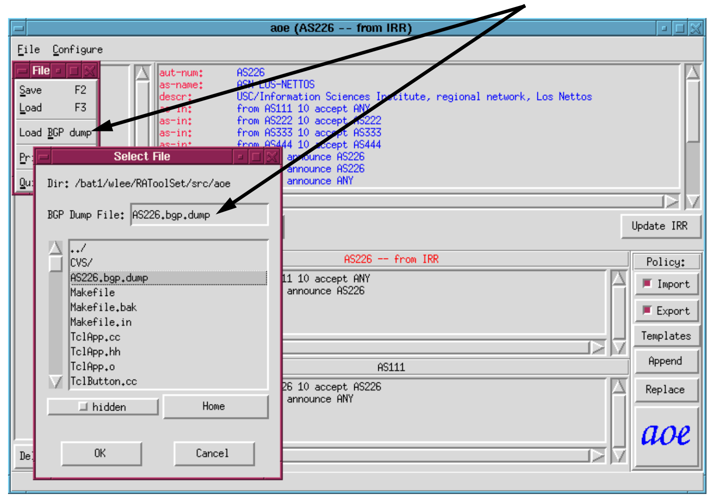
An example

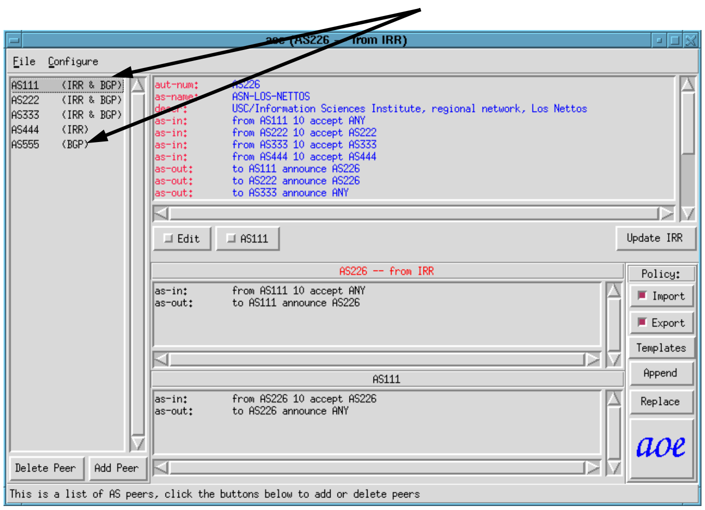


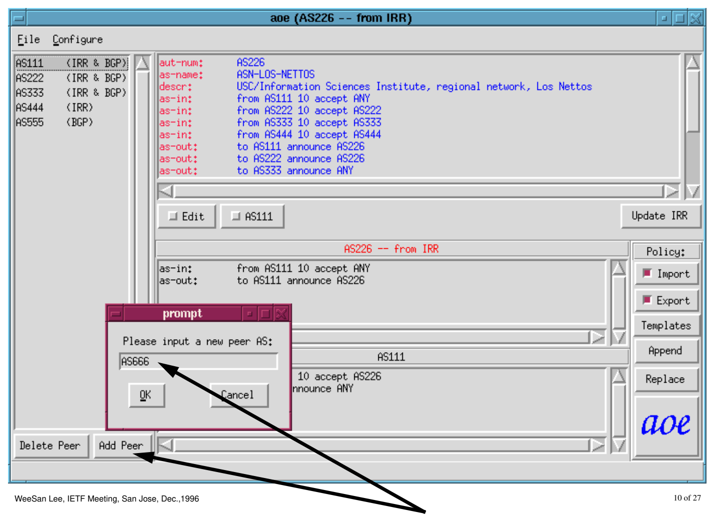
% aoe as226

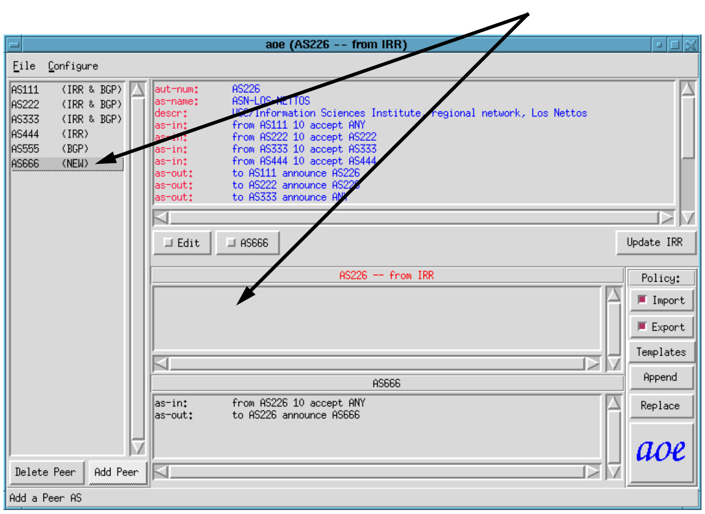


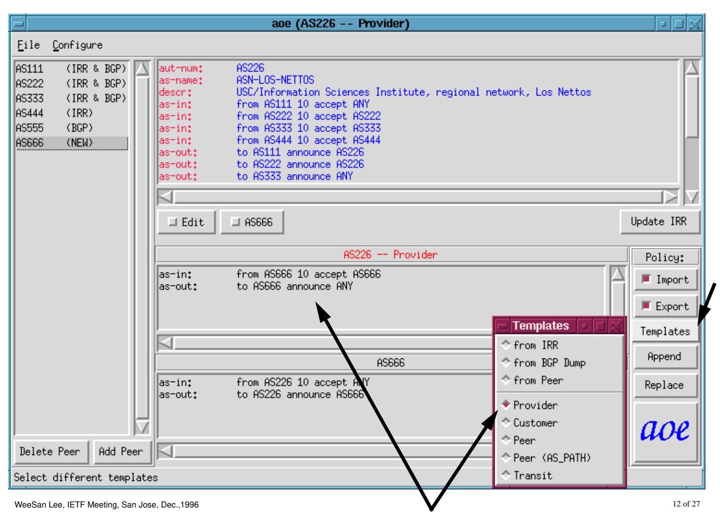

aoe (AS226 -- from IRR)
File Configure
AS111 (IRR)
AS222 (IRR)
AS333 (IRR)
AS444 (IRR)
aut-num: AS111
as-name: PROVIDER
descr: Provider of AS226 and AS222
as-in: from AS226 10 accept AS226
as-in: from AS222 10 accept AS222
as-out: to AS226 announce ANY
as-out: to AS222 announce ANY
guardian: wlee@isi.edu
admin-c: Jon Postel
tech-c: Walt Prue
Edit
AS111
Update IRR
AS226 -- from IRR
as-in: from AS111 10 accept ANY
as-out: to AS111 announce AS226
AS111
as-in: from AS226 10 accept AS226
as-out: to AS226 announce ANY
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer
Toggle the display of current AS or peer AS

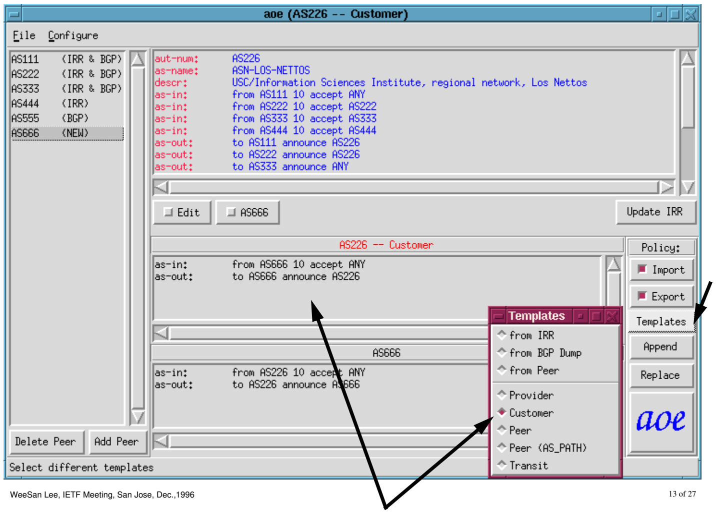

aoe (AS226 -- from IRR)
File Configure
File
Save F2
Load F3
Load BGP dump
Select File
Dir: /bat1/wlee/RAToolSet/src/aoe
BGP Dump File: AS226.bgp.dump
../
CVS/
AS226.bgp.dump
Makefile
Makefile.bak
Makefile.in
TclApp.cc
TclApp.hh
TclApp.o
TclButton.cc
hidden
Home
OK
Cancel
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
from AS111 10 accept ANY
from AS222 10 accept AS222
from AS333 10 accept AS333
from AS444 10 accept AS444
announce AS226
announce AS226
announce ANY
Update IRR
AS226 -- from IRR
AS111
Policy:
Import
Export
Templates
Append
Replace
aoe


aoe (AS226 -- from IRR)
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
Edit
AS111
Update IRR
AS226 -- from IRR
as-in: from AS111 10 accept ANY
as-out: to AS111 announce AS226
AS111
as-in: from AS226 10 accept AS226
as-out: to AS226 announce ANY
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer
This is a list of AS peers, click the buttons below to add or delete peers


aoe (AS226 -- from IRR)
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
Edit
AS111
Update IRR
AS226 -- from IRR
as-in: from AS111 10 accept ANY
as-out: to AS111 announce AS226
prompt
Please input a new peer AS:
AS666
OK
Cancel
AS111
10 accept AS226
nnounce ANY
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer


aoe (AS226 -- from IRR)
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
AS666 (NEW)
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
Edit
AS666
Update IRR
AS226 -- from IRR
AS666
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS666
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer
Add a Peer AS


aoe (AS226 -- Provider)
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
AS666 (NEW)
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
Edit
AS666
Update IRR
AS226 -- Provider
as-in: from AS666 10 accept AS666
as-out: to AS666 announce ANY
AS666
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS666
Templates
from IRR
from BGP Dump
from Peer
Provider
Customer
Peer
Peer (AS_PATH)
Transit
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer
Select different templates



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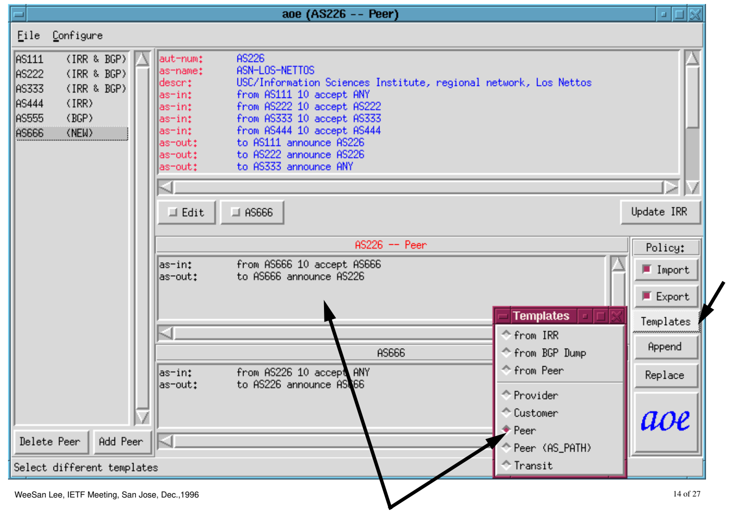

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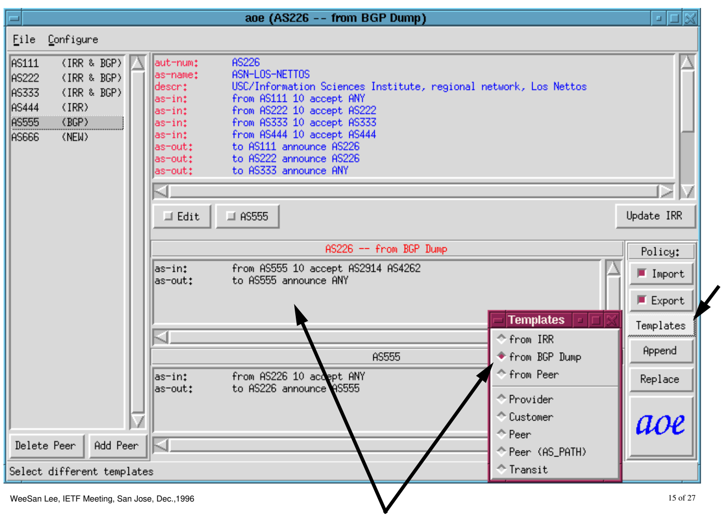

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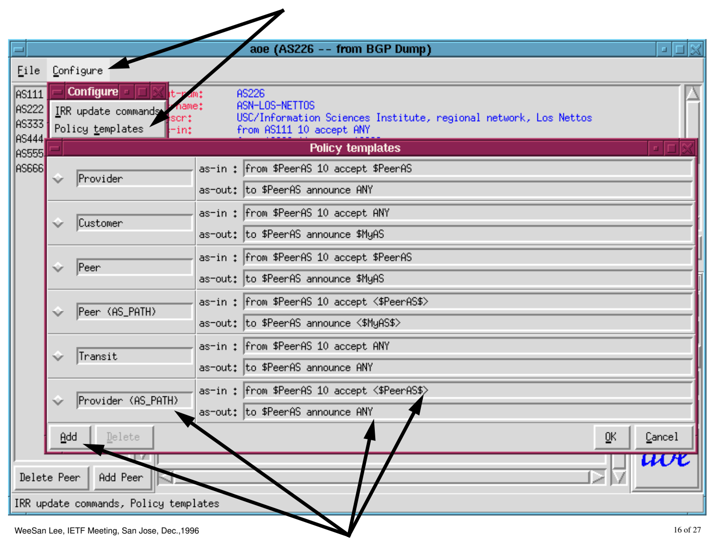

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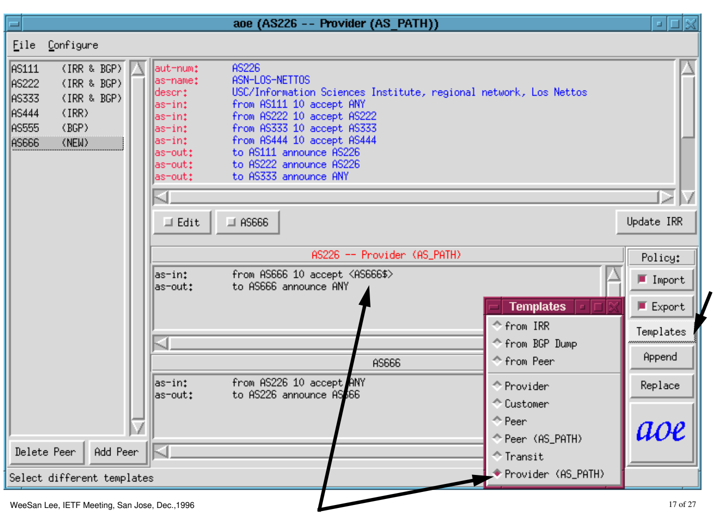

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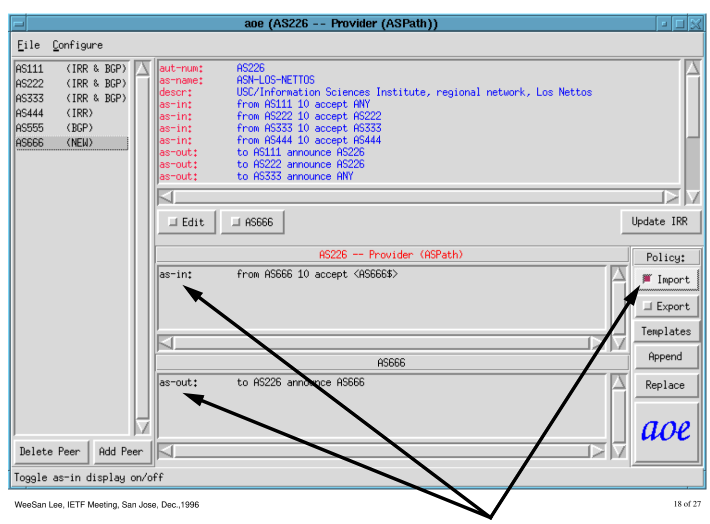

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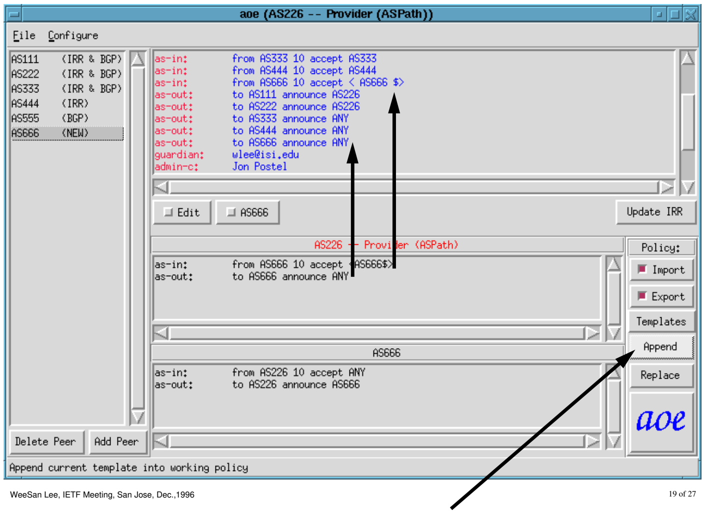
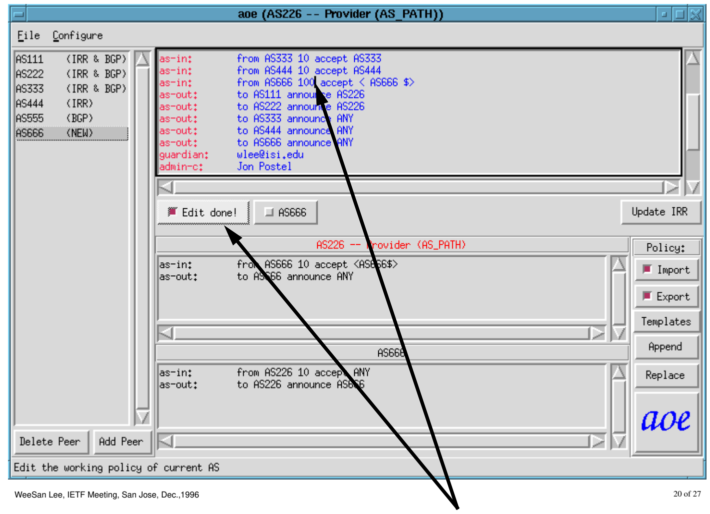
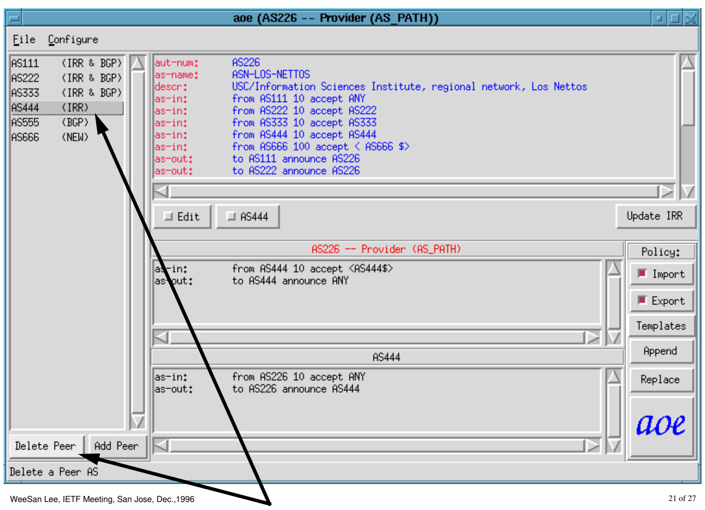
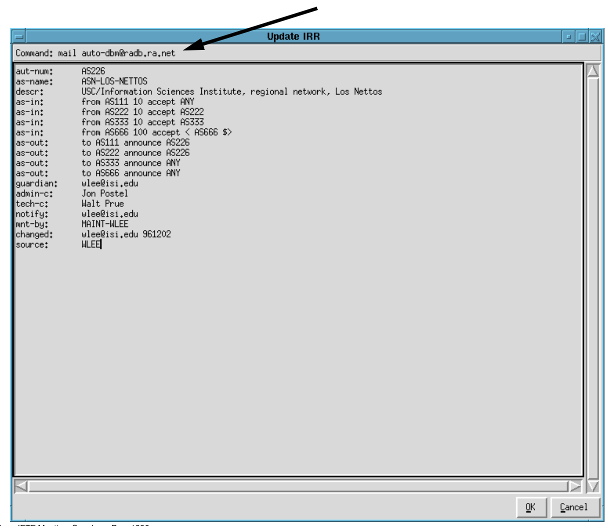
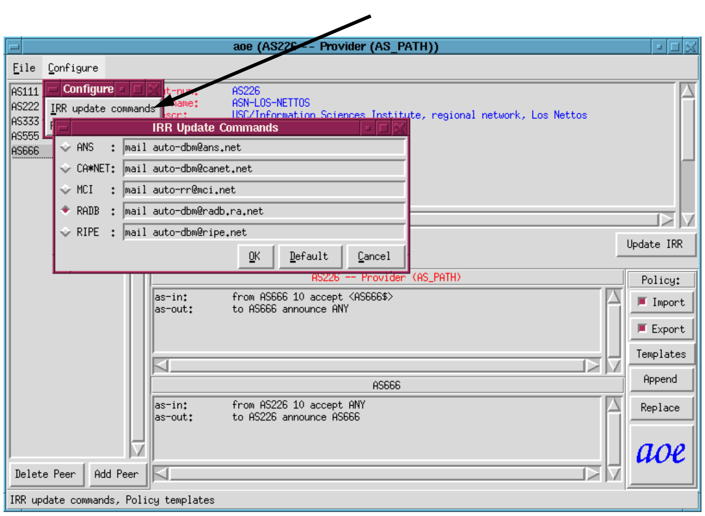
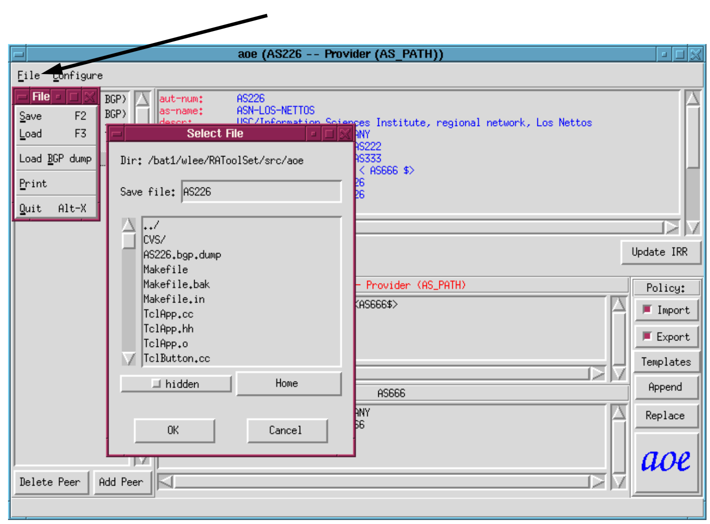

aoe (AS226 -- Provider (ASPath))
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
AS666 (NEW)
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-in: from AS666 10 accept < AS666 $>
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
as-out: to AS444 announce ANY
as-out: to AS666 announce ANY
guardian: wlee@isi.edu
admin-c: Jon Postel
Edit
AS666
Update IRR
AS226 -- Provider (ASPath)
Policy:
as-in: from AS666 10 accept <AS666$>
as-out: to AS666 announce ANY
Import
Export
Templates
AS666
Append
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS666
Replace
aoe
Delete Peer
Add Peer
Append current template into working policy

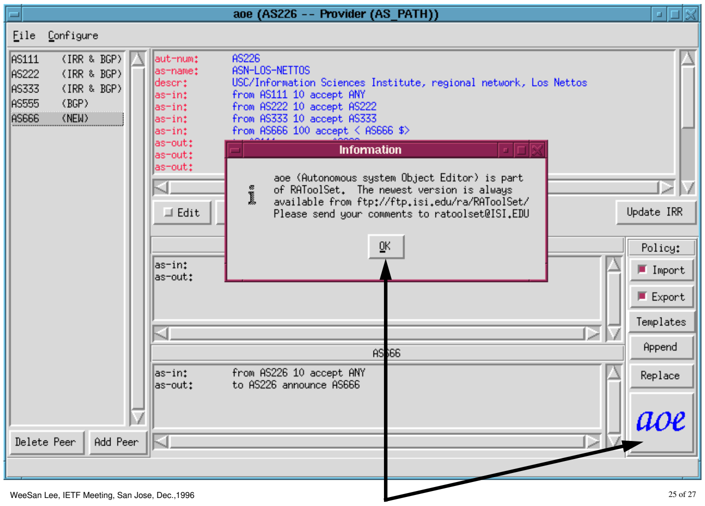

aoe (AS226 -- Provider (AS_PATH))
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
AS666 (NEW)
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-in: from AS666 100 accept < AS666 $>
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
as-out: to AS444 announce ANY
as-out: to AS666 announce ANY
guardian: wlee@isi.edu
admin-c: Jon Postel
Edit done!
AS666
Update IRR
AS226 -- Provider (AS_PATH)
Policy:
as-in: from AS666 10 accept <AS666$>
as-out: to AS666 announce ANY
Import
Export
Templates
AS666
Append
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS666
Replace
aoe
Delete Peer
Add Peer
Edit the working policy of current AS


aoe (AS226 -- Provider (AS_PATH))
File Configure
AS111 (IRR & BGP)
AS222 (IRR & BGP)
AS333 (IRR & BGP)
AS444 (IRR)
AS555 (BGP)
AS666 (NEW)
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS444 10 accept AS444
as-in: from AS666 100 accept < AS666 $>
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
Edit
AS444
Update IRR
AS226 -- Provider (AS_PATH)
Policy:
as-in: from AS444 10 accept <AS444$>
as-out: to AS444 announce ANY
Import
Export
Templates
AS444
Append
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS444
Replace
aoe
Delete Peer
Add Peer
Delete a Peer AS


Update IRR
Command: mail auto-dbm@radb.ra.net
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
as-in: from AS111 10 accept ANY
as-in: from AS222 10 accept AS222
as-in: from AS333 10 accept AS333
as-in: from AS666 100 accept < AS666 $>
as-out: to AS111 announce AS226
as-out: to AS222 announce AS226
as-out: to AS333 announce ANY
as-out: to AS666 announce ANY
guardian: wlee@isi.edu
admin-c: Jon Postel
tech-c: Walt Prue
notify: wlee@isi.edu
mnt-by: MAINT-WLEE
changed: wlee@isi.edu 961202
source: WLEE
OK
Cancel


aoe (AS226 -- Provider (AS_PATH))
File Configure
Configure
IRR update commands
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
IRR Update Commands
ANS : mail auto-dbm@ans.net
CA*NET: mail auto-dbm@canet.net
MCI : mail auto-rr@mci.net
RADB : mail auto-dbm@radb.ra.net
RIPE : mail auto-dbm@ripe.net
OK
Default
Cancel
Update IRR
AS226 -- Provider (AS_PATH)
Policy:
as-in: from AS666 10 accept <AS666$>
as-out: to AS666 announce ANY
Import
Export
Templates
AS666
Append
as-in: from AS226 10 accept ANY
as-out: to AS226 announce AS666
Replace
aoe
Delete Peer
Add Peer
IRR update commands, Policy templates


aoe (AS226 -- Provider (AS_PATH))
File Configure
File
Save F2
Load F3
Load BGP dump
Print
Quit Alt-X
aut-num: AS226
as-name: ASN-LOS-NETTOS
descr: USC/Information Sciences Institute, regional network, Los Nettos
Select File
Dir: /bat1/wlee/RAToolSet/src/aoe
Save file: AS226
../
CVS/
AS226.bgp.dump
Makefile
Makefile.bak
Makefile.in
TclApp.cc
TclApp.hh
TclApp.o
TclButton.cc
hidden
Home
OK
Cancel
Update IRR
Policy:
Import
Export
Templates
Append
Replace
aoe
Delete Peer
Add Peer



Future work

- Support RPSL
- Cooperate with other tools
- More & better heuristic methods

Available

- Part of RAToolSet
- Shares the same requirements
  - gcc 2.7.2 or later
  - libg++ 2.7.2 or later
  - Tcl 7.5 / Tk 4.1 or later
- ftp://ftp.isi.edu/ra/RAToolSet/
  (RAToolSet 3.5.0 or later)