

# Firewall Virtualization for Grid Applications

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## Work Group

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- 0.) Agenda, note-taker, IPR statement, Charter discussion
    - Ralph Niederberger (FZJ)
  
  - 1.) Introduction and status of FVGA-WG
    - Ralph Niederberger (FZJ)
  
  - 2.) Group discussions
    - All

# Introduction and status of FVGA-WG

## Group Abbreviation:

➤ fvga-wg

## Group Name:

➤ Firewall Virtualization for Grid Applications  
- Working Group

## Area:

➤ Infrastructure

- Grid Computing
  - vision of applications having on-demand, ubiquitous access to distributed services running on diverse, managed resources like computation, storage, instruments, and networks among others, that are owned by multiple administrators.
  - dynamic, seamless Virtual Organizations (VOs) using distributed resources
  - application driven transport privileges from the network
  - pre-existing security policies within the network  
(firewalls, NAT, ALG, VPN-GW)
  - administrator/manual intervention to work.
- fi-rg has documented use cases & issues that Grid applications face (GFD.83) and has documented which cases need additional attention (GFD.142)
- fvga-wg
  - will leverage the application requirements from FI-RG
  - standardize a set of service definitions for a virtualized control interface into firewalls and other midboxes allowing grid applications to securely and dynamically request application/workflow-specific services

- Produce a standard set of service definitions that provide an abstract interface for an authorized grid application to specify its data-path traversal requirements:
  - Port opening/closing service
  - Data Plane and Service Plane interactions
  - Requests from within and outside the security domain
- A set of security recommendations surrounding the application interacting with the Firewall service at the control and data plane including AAA of the service requests
- A best practices document for the network-administrator and a grid-administrator to understand the architecture and security implications of this deployment including:
  - Deployment scenarios and use-cases
  - Interactions between various Grid components
  - Examples of successful prototype deployments
- The resulting standards from the working-group will enable Grid-Middleware/Network services developers to implement a virtualized firewall service, integrate with Grid-middleware security and provide a dynamic firewall service to the Grid applications.
- The working group will ensure that it is compatible with the OGSA architecture and leverages the security infrastructure and standards for Grid Applications.

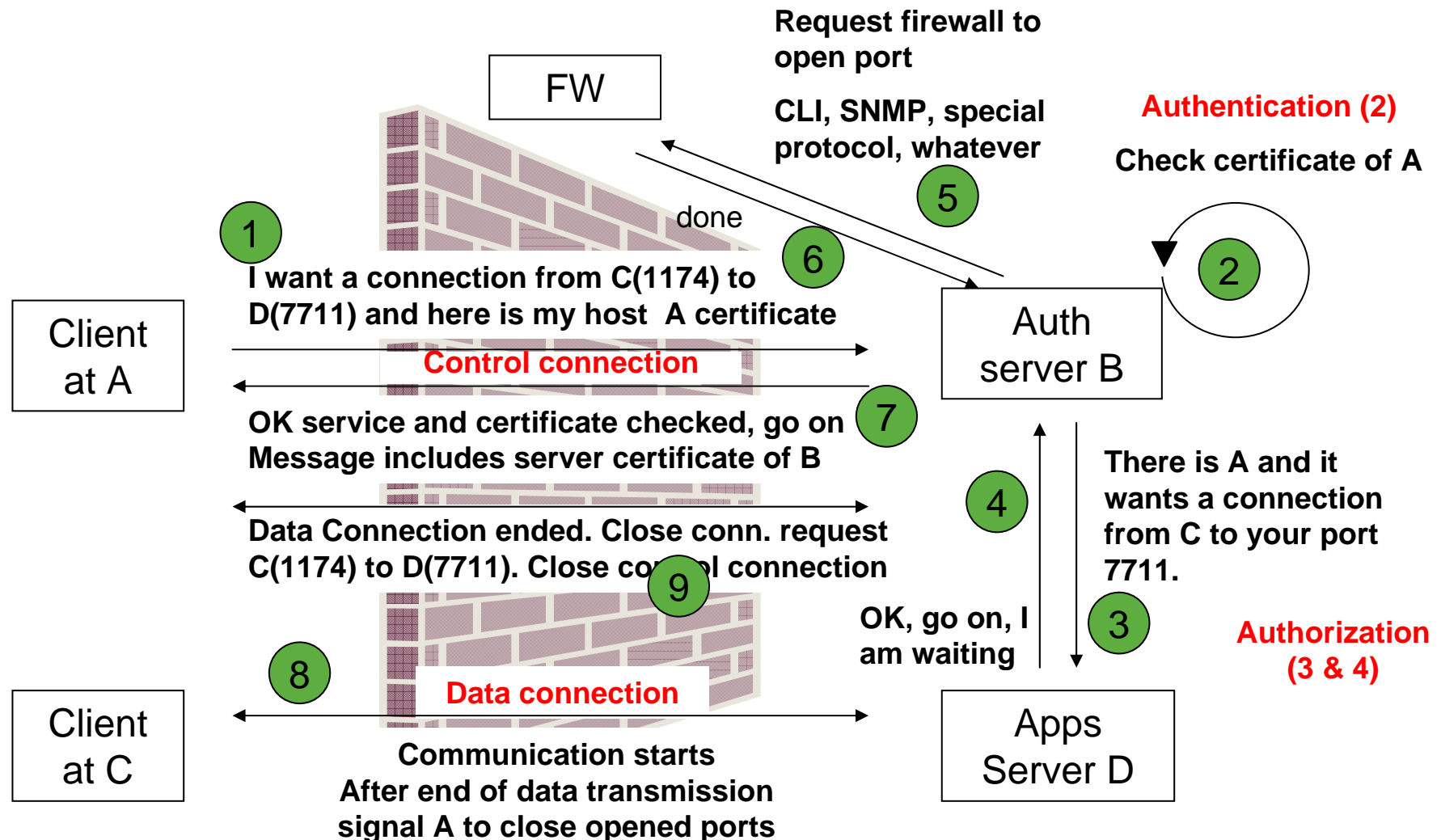
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|---------|---|
| OGF23:  | Charter discussion and group volunteers   |
| OGF24:  | Discussion on requirements to define the standardized service interface for virtualized Firewalls   |
| OGF25:  | Draft on Firewall-Virtualization-Service<br>Discussion on Security, AAA and Grid-Security aspects   |
| OGF26:  | Firewall Virtualization-Service draft version 2<br>First draft on Security recommendations (v1) for FVGA  |
| OGF27:  | Finalized Firewall Virtualization-Service draft<br>Security Recommendations v2<br>Two implementations and demonstration<br>Discussion on Best Practices draft |
| OGF28:  | WG-Last-Call for Firewall Virtualization-Service<br>Final version of Security Recommendations<br>First draft on Best Practices                                |
| OGF 29: | WG-Last-Call Security Recommendations<br>Finalize Best Practices draft  |
| OGF 30: | WG-Last-Call Best Practices Draft.  |

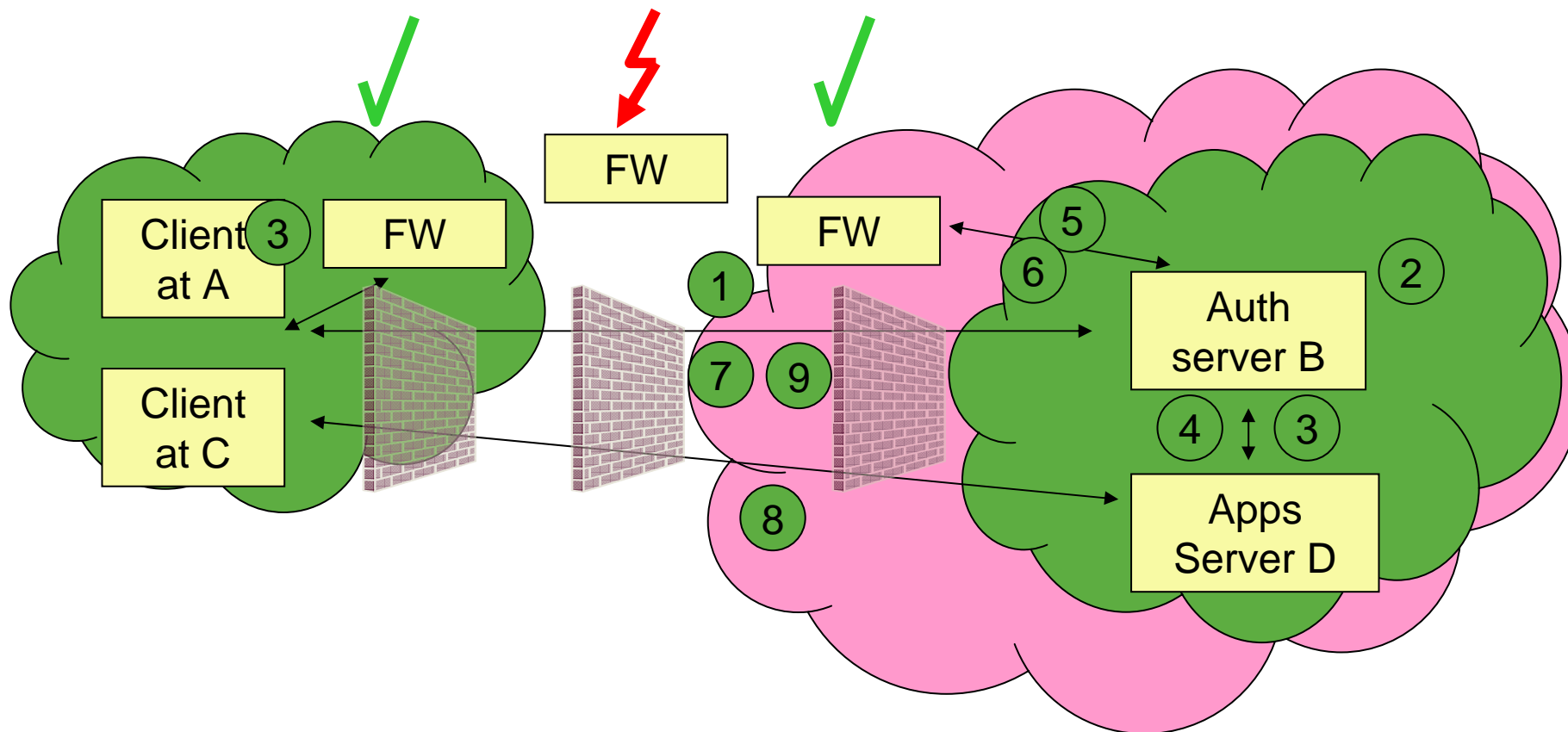


- **Mailing list:** [fvga-wg@ogf.org](mailto:fvga-wg@ogf.org)
- **Projects page:**  
<https://forge.gridforum.org/sf/projects/fvga-wg>
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- Make middleware and network resources known to each other
  - Grid middlewares should know about communication path.
  - network resources should be opened dynamically.
- End-to-end applicability
- Local authorization/authentication
- Independence of the FW vendor/implementation
  - Capabilities may be different

# First thoughts for a dynamic firewall configuration





Which parts should be standardized?

- Control connection
- Authentication
- Authorization
- Data connection

What kind of connections should be allowed? Let be:

A (Control-Connection-Client)

B (Control-Connection-Server)

C (Authentication-Server)

D (Authorization-Server)

E (Data-Client)

F (Data-Server)

$A=E \ \&/\vee \ A \neq E$

$B=C=D=F \vee B \neq C \neq D \neq F \vee$  „any combination“

Number of connections allowed?

- a) Port A to Port B
- b) Port  $[A1 \dots An]$  to Port  $[B1 \dots Bm]$
- c) Port \* to Port \*
- d) „any combination“

If multiple streams allowed, define a standard format for specifications.

Example: Interpretation of  $[A1 \dots An], [B1 \dots Bn]$ ?

- a)  $[A1-B1], [A2-B2], \dots [An-Bn]$
- b)  $[A1-B1], [A1-B2], \dots [A1-Bn], [A2-B1], [A2-B2], \dots, [A2-Bn], \dots, [An-Bn]$



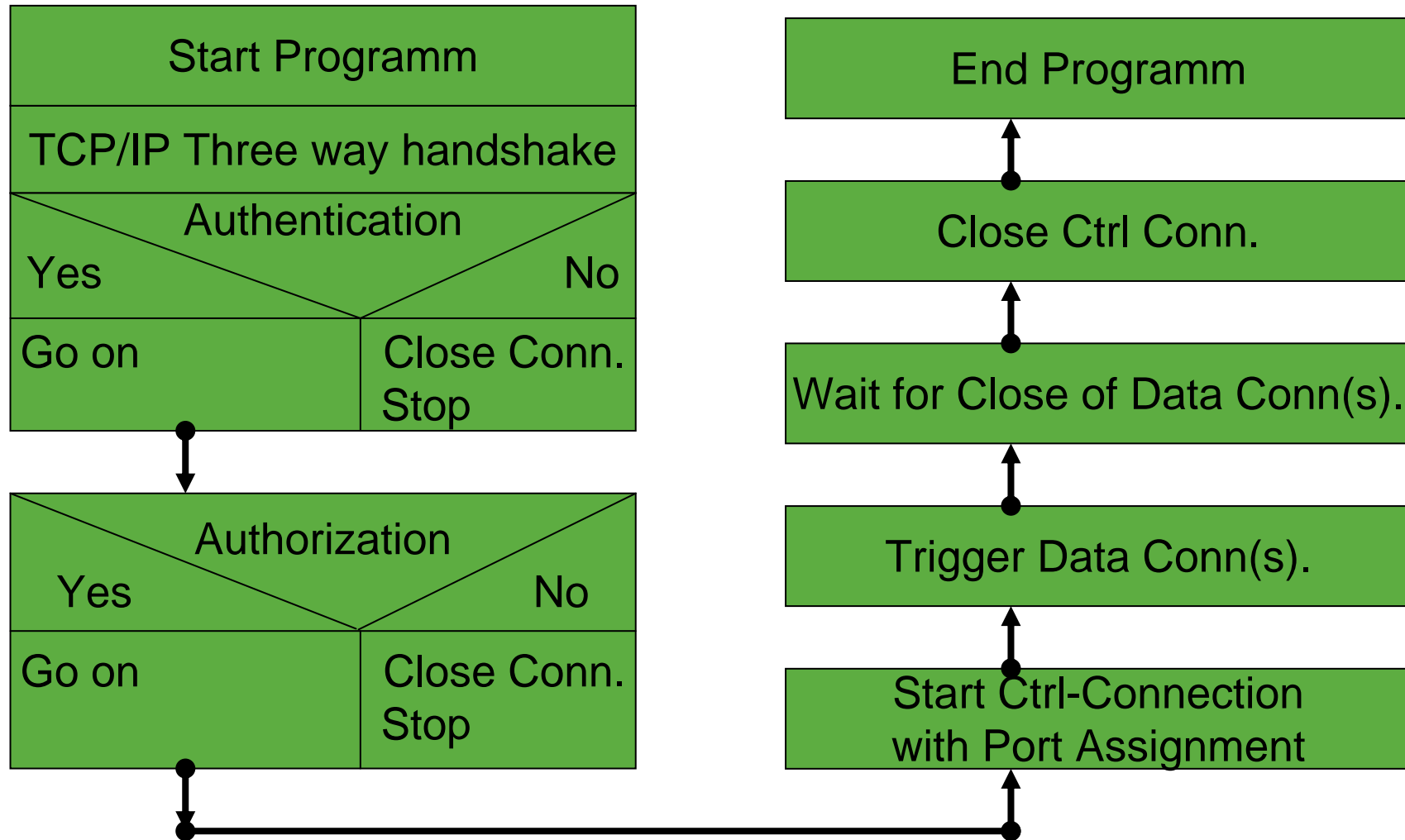
How does the exchange of used (to be used) ports take place?

- a) Client says which one to use
- b) Server responds which one to use
- c) Client fixes client port and waits for server port

- Three way handshake
- Authentication
- Authorization
- Control connection established
- Agreement on dynamic port(s) to be opened including starting of session with data server (getting ports to be used)
- Data exchange (done between client and data server)
- Closing session with data server
- Closing control connection with client
- Finish connection

Of course there are additional states needed. The listing above is a first draft only.

# Program flow chart



# Questions and discussion

