iFCP Issues from 11/20/2001 Review

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Open Technical Issues

- iFCP N_PORT Network Address Definition
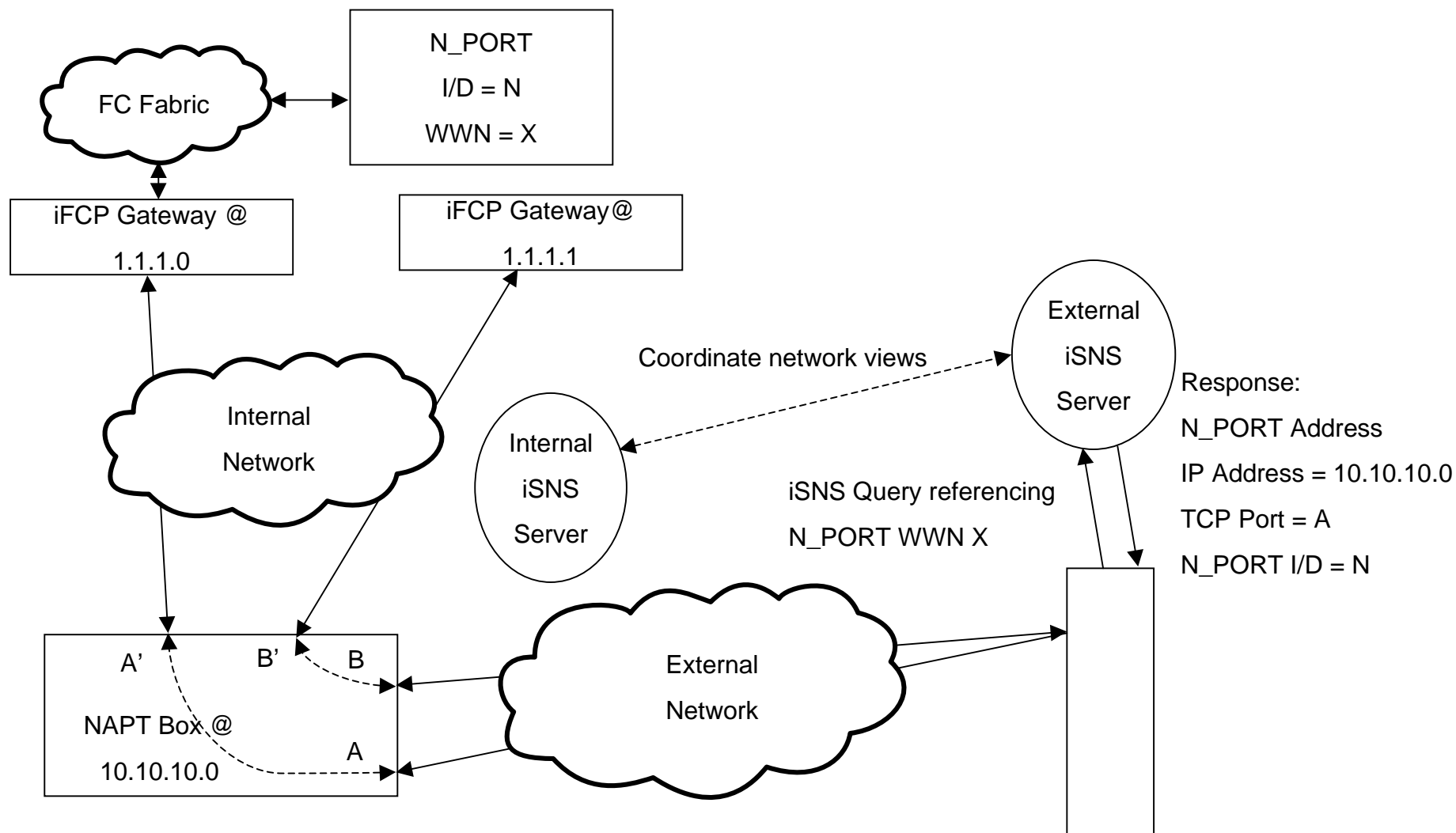- Support for FC Broadcast
- Stale Frame detection

N_PORT Network Address

- ## As of iFCP Version 7
  - ### N_PORT Address components
    - IP address of iFCP Gateway
    - Gateway-assigned N_PORT I/D

- ## Problem:
  - ### For NAPT, several gateways must share a single IP address

Proposed Solution

- Redefine Gateway Network address to add TCP Port Number

- Network Address of N_PORT
  - Gateway Network Address
    - Gateway's <IP Address, TCP Port Number> tuple
  - Gateway-assigned N_PORT I/D

Network Address Translation

N_PORT

I/D = N

WWN = X

FC Fabric

iFCP Gateway @
1.1.1.0

iFCP Gateway@
1.1.1.1

Internal
Network

Internal
iSNS
Server

Coordinate network views

External
iSNS
Server

iSNS Query referencing
N_PORT WWN X

Response:

N_PORT Address

IP Address = 10.10.10.0

TCP Port = A

N_PORT I/D = N

A'   B'   B

NAPT Box @   A

10.10.10.0

External
Network

Changes Required

- iFCP
  - Modify definition of N_PORT network address
  - Session model unchanged

- iSNS
  - No changes
  - iSNS currently returns TCP port number as part of query response.

FC Broadcast Support

- ## FC Broadcast Mechanism
  - Best-effort, datagram service
  - Some FC-4 protocol implementations rely on broadcast for device discovery in lieu of name server support
    - IPFC -- Encapsulation of IP over fibre channel
    - FC-VI -- Fibre channel implementation of VI.
  - Broadcasts are not performance-critical
  - Frames for broadcast directed to FC broadcast server at well-known N_PORT address FF-FF-FF

Problems with iFCP Broadcast

- ## As of iFCP, revision 7

  - UDP Datagrams used for broadcast traffic

  - Peer-to-peer protocol between gateway-resident broadcast servers

- ## Problems:

  - UDP over IP may not be as reliable as FC datagram service over closed FC fabric.

  - Datagram size unduly constrains FC frame size

    - Use of IP fragmentation js undesirable

      - Known not to work well with firewalls and NAPT boxes

Proposed Solution

- ## Use TCP instead of UDP
  - After creation a broadcast iFCP session is Indistinguishable from regular iFCP sessions

- ## Define a client-server mechanism for broadcast support
  - Broadcast Client and Server are iFCP N_PORTs
  - Broadcast client
    - Sends frames to server for broadcast
    - Redistributes incoming broadcast frames locally
  - Broadcast server
    - Distributes broadcast frames to clients
      - Frames not echoed to originating client

Broadcast Client and Server

- iFCP N_PORT with standard FC world wide name

- N_PORT network address
  - IP Address, TCP Port Number of gateway
  - N_PORT I/D = 0xff-ff-ff (well-known address assigned by FC-FS)

- iFCP Broadcast Server can be implemented on any platform

Client/Server Discovery

- ## iSNS Discovery Domain
  - Define broadcast 'discovery domain'
    - Standard iSNS discovery domain
  - Broadcast server enters domain, registers for domain state change notification
    - Detects clients entering and leaving domain
  - Broadcast clients register with iSNS as domain members
  - Broadcast server discovers clients via state change notification and domain membership query

Setup

- iSNS
  - Define Broadcast domain
  - Populate domain with world-wide names of clients and server broadcast N_PORTs

Proposed iSNS Changes

- Add 'Broadcast Server' as an N_PORT attribute

Broadcast Session Management

- Sessions originated by broadcast server
  - May be long-lived or transient depending on performance and resource requirements
- May be terminated by client or server

Stale Frame Detection

- As of iFCP revision 7:
  - Implementation optional
- Proposed change
  - MUST implement
  - MUST use