Abstract

The FCIP protocol provides a method for the tunneling of Fibre Channel frames over an IP network. This document defines the use of the Service Location Protocol by FCIP entities to discover one another, and provides the appropriate SLPv2 templates describing their services.

1. Acknowledgements

This draft was produced by the FCIP discovery team, including Todd Sperry (Adaptec), Larry Lamars (SanValley), Robert Snively (Brocade),
Ravi Natarajan (Lightsand), Anil Rijhsinghani (McData), and Venkat Rangan (Rhapsody Networks). Thanks also to Mark Bakke (Cisco) for initial help and consultation.

2. Introduction

FCIP is a protocol provides a method for the tunneling of Fibre Channel frames over an IP network. This document defines the use of the Service Location Protocol (SLPv2) by FCIP entities to discover one another, and provides the appropriate SLPv2 templates describing their services.

3. Notation Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

4. Terminology

Here are some definitions that may aid readers that are unfamiliar with either SLP, SCSI, or iSCSI. Some of these definitions have been reproduced from [RFC2608] and "Finding an RSIP Server with SLP" [RSIP].

User Agent (UA) A process working on the client’s behalf to establish contact with some service. The UA retrieves service information from the Service Agents or Directory Agents.

Service Agent (SA) A process working on behalf of one or more services to advertise the services and their capabilites.

Directory Agent (DA) A process which collects service advertisements. There can only be one DA present per given host.

Scope A named set of services, typically making up a logical administrative group.

Service Advertisement A URL, attributes, and a lifetime (indicating how long the advertisement is valid), providing service access information and capabilities description.
for a particular service.

**FCIP Entity**
The principle FCIP interface point to the IP network.

**FCIP Entity Name**
The world wide name of the switch if the FCIP Entity resides in a switch or the world wide node name of the associated Nx_Port.

**FCIP Discovery Domain**
The FCIP Discovery Domain specifies which FCIP Entities are allowed to connect within the bounds of the scope.

5. Using SLP for FCIP Service Discovery

At least two FCIP Entities must be involved in the entity discovery process. The end result is that an FCIP Entity will discover one or more peer FCIP Entities.
5.1. Discovering FCIP Entities using SLP

The following example diagram shows the relationship between FCIP Entities and their associated SLP agents.

```
+--------------------------------------+
|           FCIP Entity                |
| +----------------------------+       |
|   | FCIP Control and Services Module |   |
| SA   | UA    |                               |
| +----------------------------+       |
|   TCP/UDP/IP                  |
| +----------------+             |
|   | Interface   |                     |
|   | 180.10.1.10  |                     |
| +----------------+             |
|   | SLP DA       |----+  IP Network      |
|   +----------------+             |
+--------------------------------------+
```

Fig. 1 FCIP Entity and SLP Agent Relationship.

As indicated in the above drawing above, each FCIP Entity contains an FCIP Control and Services Module that interfaces to an SLPv2 SA and UA.

The SA constructs a service advertisement of the type "service:fcip:entity" for each of the service URLs it wishes to register. The service advertisement contains a lifetime, along with other attributes defined in the service template.

The remainder of the discovery process is identical to that used by any client/server pair implementing SLPv2:
1. If an SLPv2 DA is found, the SA contacts the DA and registers the service advertisement. If no DA is found, the SA maintains the service advertisement itself, answering multicast UA queries directly.

2. When the FCIP Entity requires contact information for a peer FCIP Entity, the UA either contacts the DA using unicast or the SA using multicast. The UA includes a query based on the attributes to indicate the characteristics of the FCIP Entities it requires.

3. Once the UA has the IP address and port number of the FCIP Entity it may begin the normal connection procedure to the FCIP Entity.

The use of a DA is recommended for SLP operation in an FCIP environment.

6. FCIP SLPv2 Templates

Two templates are provided: an FCIP Entity template, and an abstract template to provide a means to add other FCIP related templates in the future.

6.1. The FCIP Abstract Service Type Template

This template defines the abstract service "service:fcip". It is used as a top-level service to encapsulate all other FCIP related services.

Name of submitter: David Peterson
Language of service template: en
Security Considerations:
  See the security considerations of the concrete service type.

Template Text:
-------------------------template begins here-----------------------
template-type=fcip
template-version=0.1

template-description=
  This is an abstract service type. The purpose of the fcip service type is to encompass all of the services used to support the FCIP protocol.

template-url-syntax =
  url-path= ; Depends on the concrete service type.
6.2. The FCIP Entity Concrete Service Type Template

This template defines the service "service:fcip:entity". A device containing FCIP Entities that wishes to have them discovered via SLPv2 would register each of them, with each of their addresses, as this service type.

FCIP Entities wishing to discover other FCIP Entities in this manner will generally use one of the following query strings:

1. Find a specific FCIP Entity, given its FCIP Entity Name:

   Service:  service:fcip:entity
   Scope: fcip-entity-scope-list
   Query: (fcip-entity-name=10:00:00:60:69:20:34:0C)

2. Find all of the FCIP Entities within a specified FCIP Discovery Domain:

   Service:  service:fcip:entity
   Scope: fcip-entity-scope-list
   Query: (fcip-discovery-domain=fcip-discovery-domain-name)

3. In addition, a management application may wish to discover all FCIP Entities:

   Service:  service:fcip:entity
   Scope: management-service-scope-list
   Query: none

Name of submitter: David Peterson
Language of service template: en
Security Considerations:
   See later section.

Template Text:
----------------------------template begins here----------------------------
template-type=fcip:entity
template-version=0.1
template-description=
   This is a concrete service type. The fcip:entity service type is used to register individual FCIP Entity addresses to be discovered by others.
UAs will generally search for these by including one of the following:
- the FCIP Entity Name for which an address is needed
- the FCIP Discovery Domain Name for which addresses are requested
- the service URL

template-url-syntax =
  url-path = ipaddr [ : tcpport ] / fcip-entity-name
  ipaddr = DNS host name or ip address
  tcpport = decimal tcp port number
  fcip-entity-name = FCIP Entity Name

# The fcip-entity-name portion of the URL is required and must be the
# FCIP Entity Name of the entity being registered.
# An entity representing multiple endpoints must register each of them
# using SLPv2.
#
# Examples:
# service:fcip:entity://hammer.cisco.com:4000/10:00:00:60:69:20:34:0C
# service:fcip:entity://192.1.3.40:4000/10:00:00:60:69:20:34:0C
#

fcip-entity-name = opaque L
  # This must match the fcip-entity-name specified in the url-path.
  # The fcip-entity-name is either the Fibre Channel Switch Name if the
  # FCIP Entity is embedded in a switch or the Fibre Channel Node Name
  # if the FCIP Entity is not embedded in a switch (e.g, an Nx_Port).

fabric-name = opaque O L
  # The fabric-name is the World Wide Name of the principal switch.

switch-name = opaque O L
  # A name identifier associated with a Fibre Channel switch or bridge device.
  # Refer to FC-SW-2 for further information.

node-name = opaque O L
  # A name identifier associated with a Fibre Channel node.
  # Refer to FC-FS for a description of a Fibre Channel node.

transports = string M L
  tcp
    # This is a list of transport protocols that the registered entity
    # supports. FCIP is currently supported over TCP only.
  tcp

mgmt-entity = string O
  # The FQDN of the management interface of the FCIP Entity.

mgmt-ipaddr = string O
7. Security Considerations

Service type templates provide information that is used to interpret information obtained by clients through SLP. If the FCIP templates are modified or if false templates are distributed, FCIP Entities may not correctly register themselves or may not be able to interpret service information.

SLP provides an authentication mechanism for UAs to assure that service advertisements only come from trusted SAs. [RFC2608] If trust is an issue, particularly with the information sought by the client about IPSec and IKE support, then SLP authentication should be enabled in the network.

Once an FCIP Entity is discovered, authentication and authorization are handled by the FCIP protocol. It is the responsibility of the providers of these services to ensure that an inappropriately advertised or discovered service does not compromise their security.

8. Summary

This document describes how SLPv2 can be used by FCIP Entities to find other FCIP Entities. Service type templates for FCIP Entities are presented.

9. References


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