



The Jini[™] Architecture

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Objectives

- Introduction to Jini network technology,
- Jini system design goals,
- System overview,
- Example and
- Conclusion

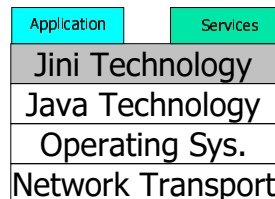


What is JiniTM?

- It is a distributed system used for federating groups of users and resources required by those users. In simple terms it is network turned into a flexible, easily administered tool on which distributed resource can be found by human and computational clients.
- Resources can be either hardware, software or a combination of the two.
- The architecture provides an infrastructure for defining, advertising and finding resources on a network.



More about Jini ...



- Jini technology extends Java technology from a single virtual machine to a network of machines.
- Provides good computing platform for distributed computing because both code and data can move from machine to machine.



Design Goals

It is designed to allow service on a network be available to any one who can reach it.

- Network plug-and-work,
- Erase hardware / software distinction,
- Enable spontaneous networking,
- Provide service-based architecture,
- Simplicity,
- Sharing resources



System Overview

- The architecture of a single Jini system is targeted to the workgroup.
- It consists of :
 - Services,
 - Service protocols discovery, join and lookup,
 - Java RMI (Remote Method Invocation),
 - Security,
 - Leasing, Transactions and Events.



Services

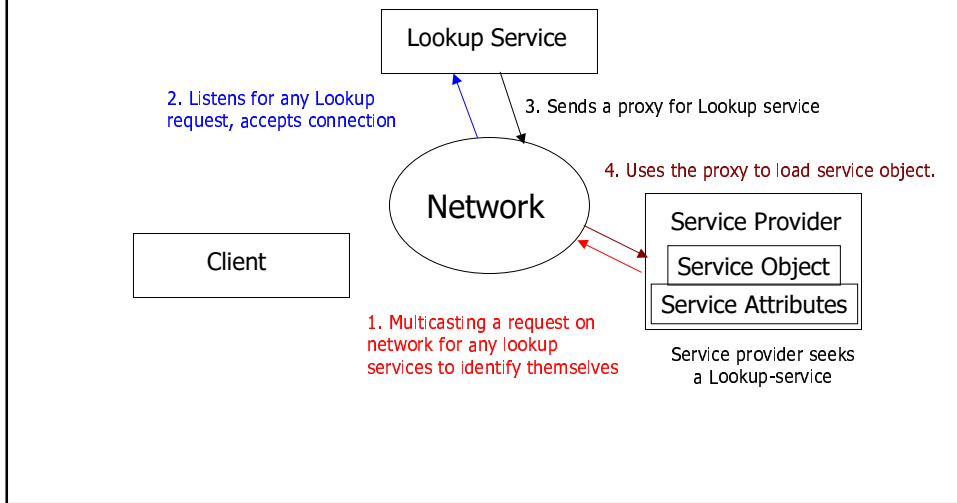
- A service is an entity that can be used by person, a program, or another service.
- A service is computation, storage, a communication channel to another user, a hardware device or another user.
- Jini provides service construction, lookup, communication, and use of distributed system.
- Services in Jini communicate with each other by using a service protocol.



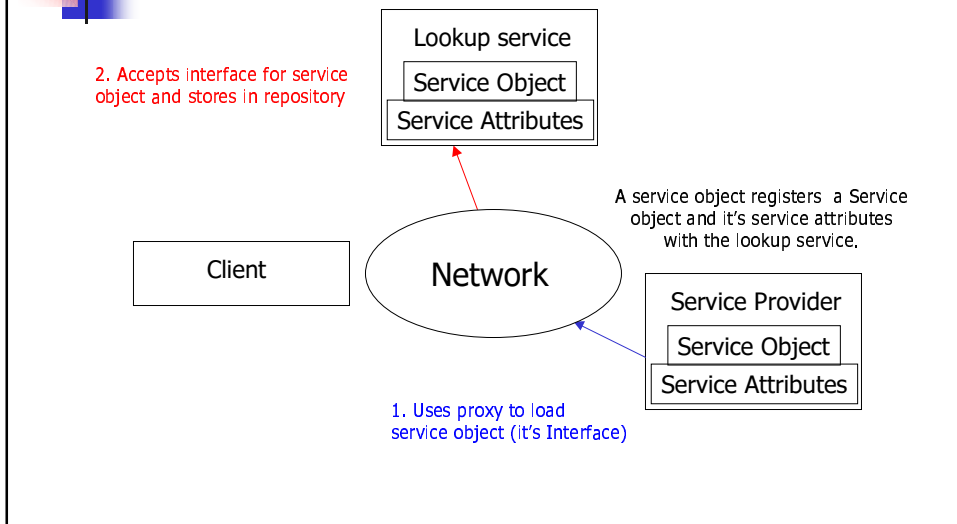
Service Protocols

- Heart of Jini System.
- Discovery occurs when a service is looking for a lookup service with which to register.
- Join occurs when a service has located a lookup service and wishes to join it.
- Lookup is used to find service by it's type and descriptive attributes which are used in user interface for lookup service.

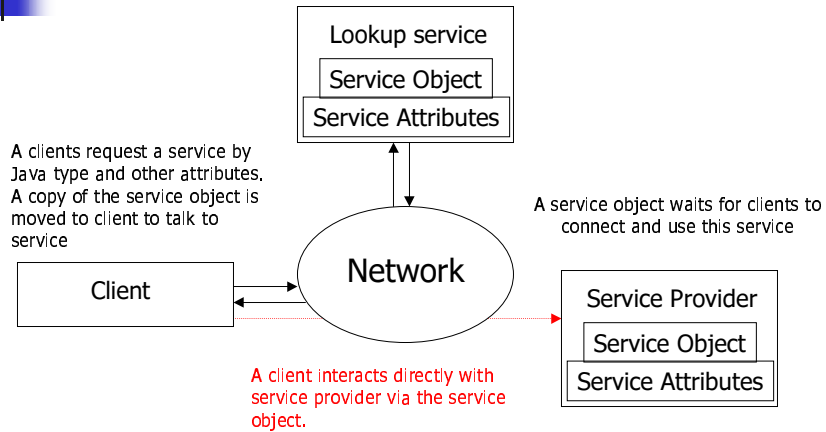
Working of discovery



Working of Join



Finding services and invoking.



Java RMI

- Fundamentally it is Java-Programming language enabled extension to traditional RPC.
- It's a part of Jini Technology infrastructure.
- It provides mechanism to find, activate and garbage collect object groups.
- RMI not only allows data from objects to be passed around network, but object itself.



Security

- Built on two twin notions of :
 1. The Principal and
 2. Access Control List
- Services accessed on behalf of some entity.
- The principal generally traces back to a particular user of the system.
- Access to service depends on the contents of an access control list that is associated with the object.



Leasing

- Access to any service in Jini is lease based.
- Each lease is negotiated between user of service and provider of service as part of service protocol.
- If the lease is not renewed before it is freed either
resource is no longer need,
client or network fails,
lease is not permitted to be renewed.
- There are Exclusive and Non-Exclusive leases.



Transactions and Events

- Series of operations, either within a service or spanning multiple services can be wrapped into a transaction.
- Jini transaction interface supply a service protocol needed to coordinate a 2-Phase protocol.
- Supports distributed events. An object may allow other objects to register interest in events in the object and receive notification on the occurrence of such an event.



Example

- Consider a Jini printing service which might be used by a digital camera to print high-resolution color image.
 - Register the printer service,
 - Discover the Lookup service,
 - Join the Lookup service,
 - Locate the Lookup service,
 - Configure the printer,
 - Requesting the image to be printed.



Conclusion

- Jini architecture provides a solid base for designing network device and service systems
- It provides platform that is robust in face of network failures, changes in composition of service, old services, competition and scale



References

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