MIT Project Athena

# Moira
# The Athena Service Management System


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# The Problem

## How to manage:

- **17,000 User accounts (7,400 active)**
- **900 Workstations**
- **66 Servers**
  - **32 NFS Servers**
  - **17 RVD Servers**
  - **9 Printer servers**
  - **3 *Hesiod* servers**
  - **3 Post office servers**
  - **2 *Kerberos* servers**

# Goals

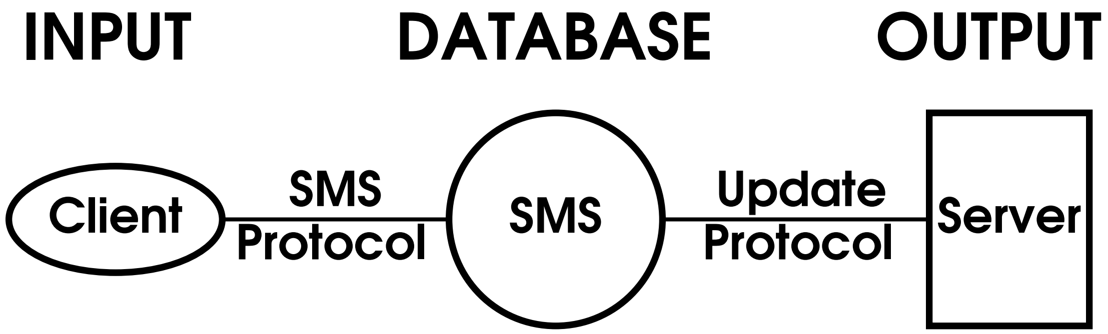
- Manage Servers
- Coordinate Servers for Consistency
- Centralize Authority

# Design Criteria

In order of importance:

- Reliability
- Consistency
- Flexibility
- Time Efficiency
- Space Efficiency

# Moira Organization



# Moira Protocol

- Built on a remote procedure call library
- Requires Authentication
- Has Four Operations
  - Authenticate
  - Query
  - Access
  - No-op

# Moira Queries

- Over 100 queries
- Grouped into 4 types:
    - Retrieve
    - Update
    - Append
    - Delete
- Table Driven
- Access Control Lists

# Moira Protocol

## Example: *chsh*

1. *Establish connection*

2. authenticate($A_{mar}$)
   => success()

3. query(get_user_by_login, mar)
   => success(mar, 17822, /bin/csh, ... )

4. access(update_user_shell, mar, /bin/csh)
   => success()

5. *Prompt user for new information*

6. query(update_user_shell, mar, /bin/tcsh)
   => success()

7. *Close Moira connection*

# Database

The database includes:

- Users
- Machines
- Clusters
- General services
- File systems
- NFS & RVD physical information
- Printers
- Post Office assignments
- Lists: groups, mailing lists, access control lists
- Aliases
- Internal control information

# Update Protocol

There are 4 operations:

- Authenticate
- Transfer
- Instructions
- Execute

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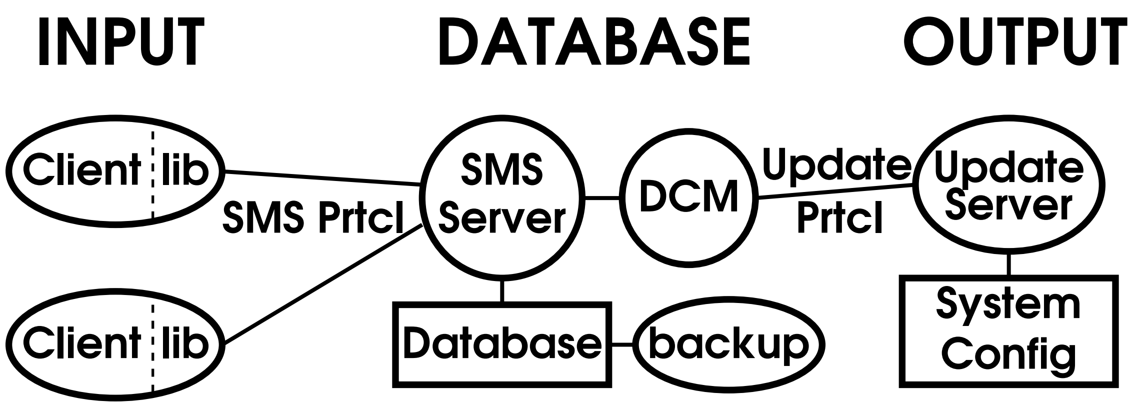
# Moira Components



# Moira Server

- Multi-threaded
- Authorization checks
- Checks legal values
- Sole access to database

# The Data Control Manager

- *cron* driven
- Configured by data in database
- Status per host/service pair
- Locking

# Moira

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