Architecture (DA1)

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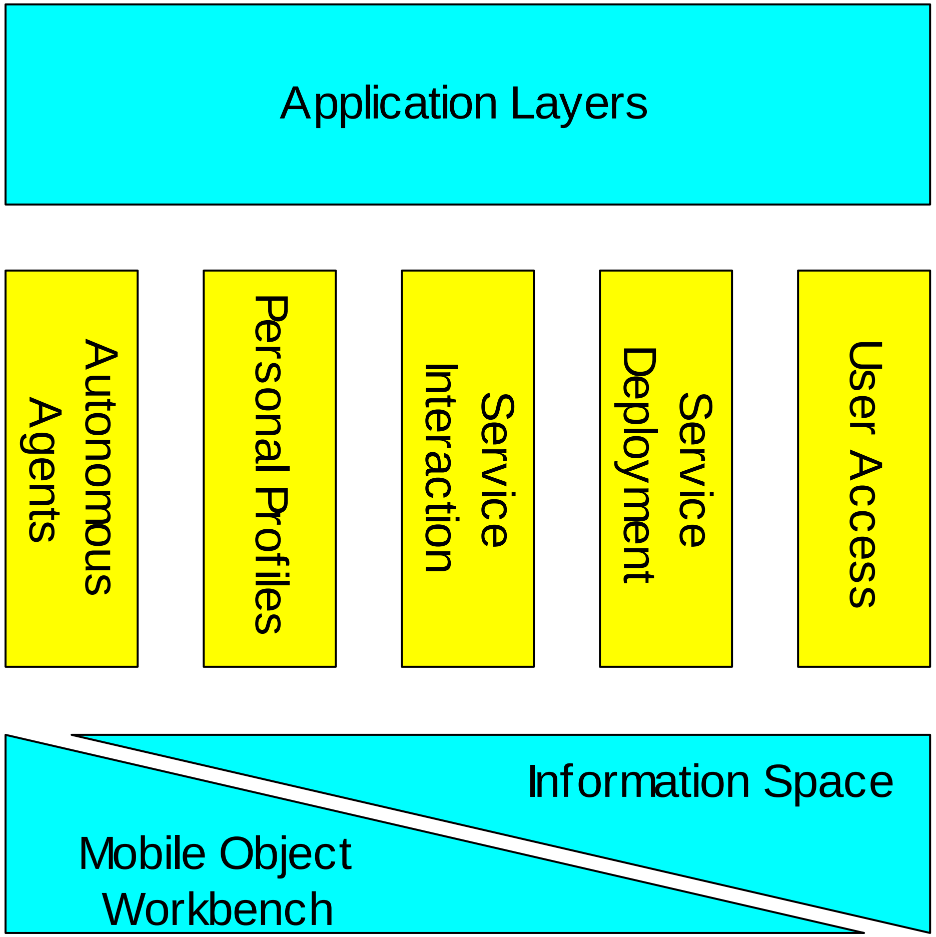
Task Definition

- Evolving series of architecture reports
  - (month 2) block diagram architecture
  - (month 6) proposed patterns architecture
  - (month 12) final architecture
- Steer implementation tasks
  - maximum componentisation
  - stable interfaces
  - minimum duplication of function
- Use APM ISO Reference Model for Open Distributed Processing knowledge
  - test validity in Internet / Java context

The FollowMe Framework



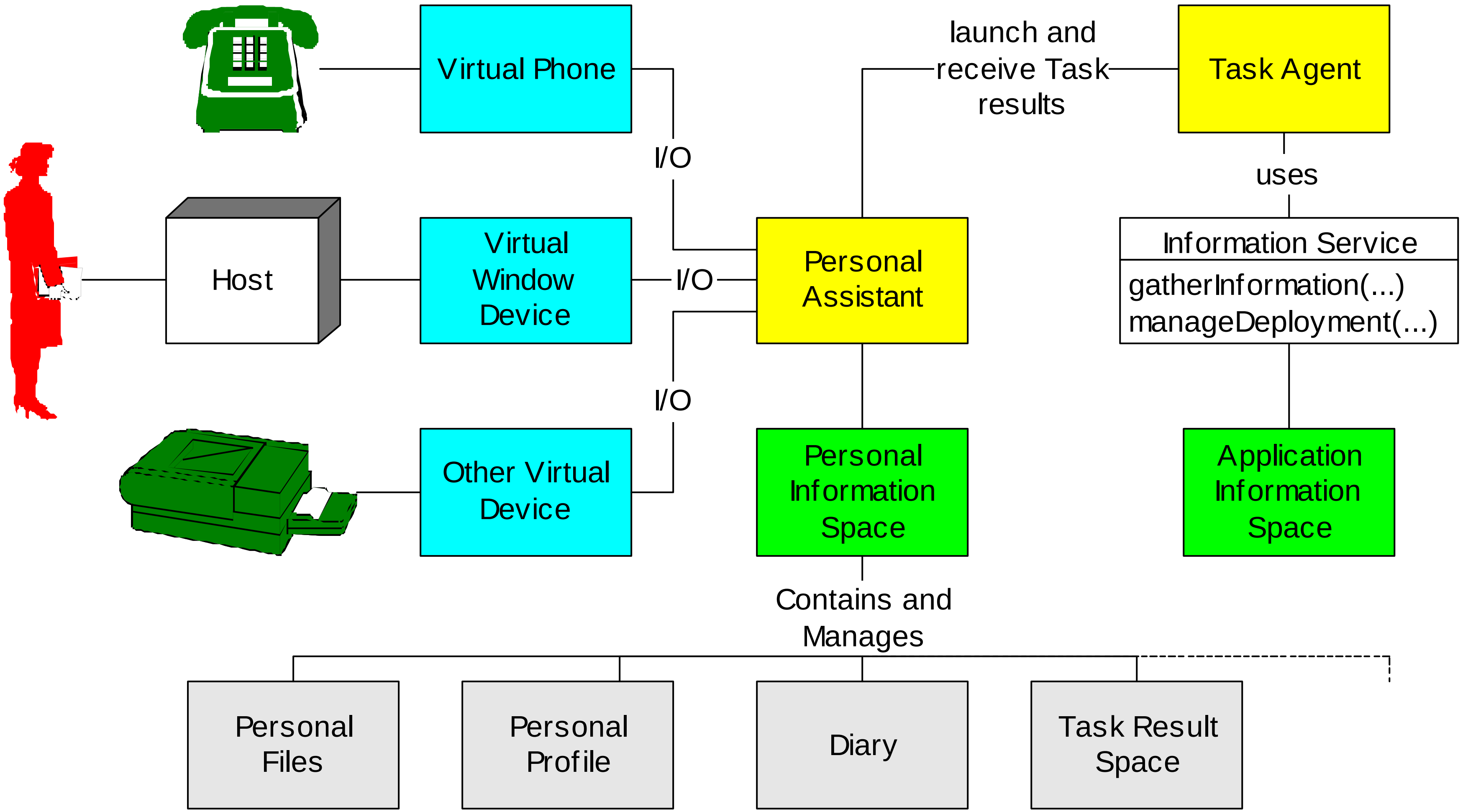
Foundations

- Basic infrastructure for “Internet Objects”
  - portable
    - run on any client or server platform in the Internet
  - mobile
    - carry intelligence with data
    - provide a visitors room rather than having to export internal functions for ease of security and management
    - active caching
    - protocols - e.g. payment
  - persistent
    - can leave information in the system
    - mask storage replication and storage access methods
  - distributed
    - allow dynamic determination of client/server split

Agency Components

- User Access
  - talk to the user in a device independent way
  - enable transparent translation
- Service Deployment
  - dynamically configure services based on load
- Personal Profiles
  - ubiquitous model for information about user
  - enables agents to be autonomous
- Service Interaction
  - templates for using services to enable scripting
- Autonomous Agents
  - take on tasks on behalf the user

Example



Virtual Phone

Virtual Window Device

Other Virtual Device

Host

I/O

I/O

I/O

Personal Assistant

launch and receive Task results

Task Agent

uses

Information Service

gatherInformation(...)

manageDeployment(...)

Personal Information Space

Application Information Space

Contains and Manages

Personal Files

Personal Profile

Diary

Task Result Space

Technology Base

- ISO Reference Model for Open Distributed Processing
  - object-oriented modelling framework
  - separation of concerns
  - transparency
- CORBA
  - global consensus that WWW is evolving to Distributed Object Computing
  - OMG CORBA dominate D.O.C. standards
- Java
  - optimised language for D.O.C.
  - bytecodes model enables mobility
  - fits ODP conceptual framework better than C++
  - absorbing CORBA protocols
  - reflection and introspection give cleaner APIs

ODP Interpretation

- An ODP Computational Specification containing a reflection of an ODP Engineering Specification for the infrastructure
- An Information Specification for personal profiles using XML as an information modelling language
- An Information Specification for agents using Service Descriptions
- Implementation of migration and persistence transparency
- Computational structures for common patterns with informal information specifications for their behaviour

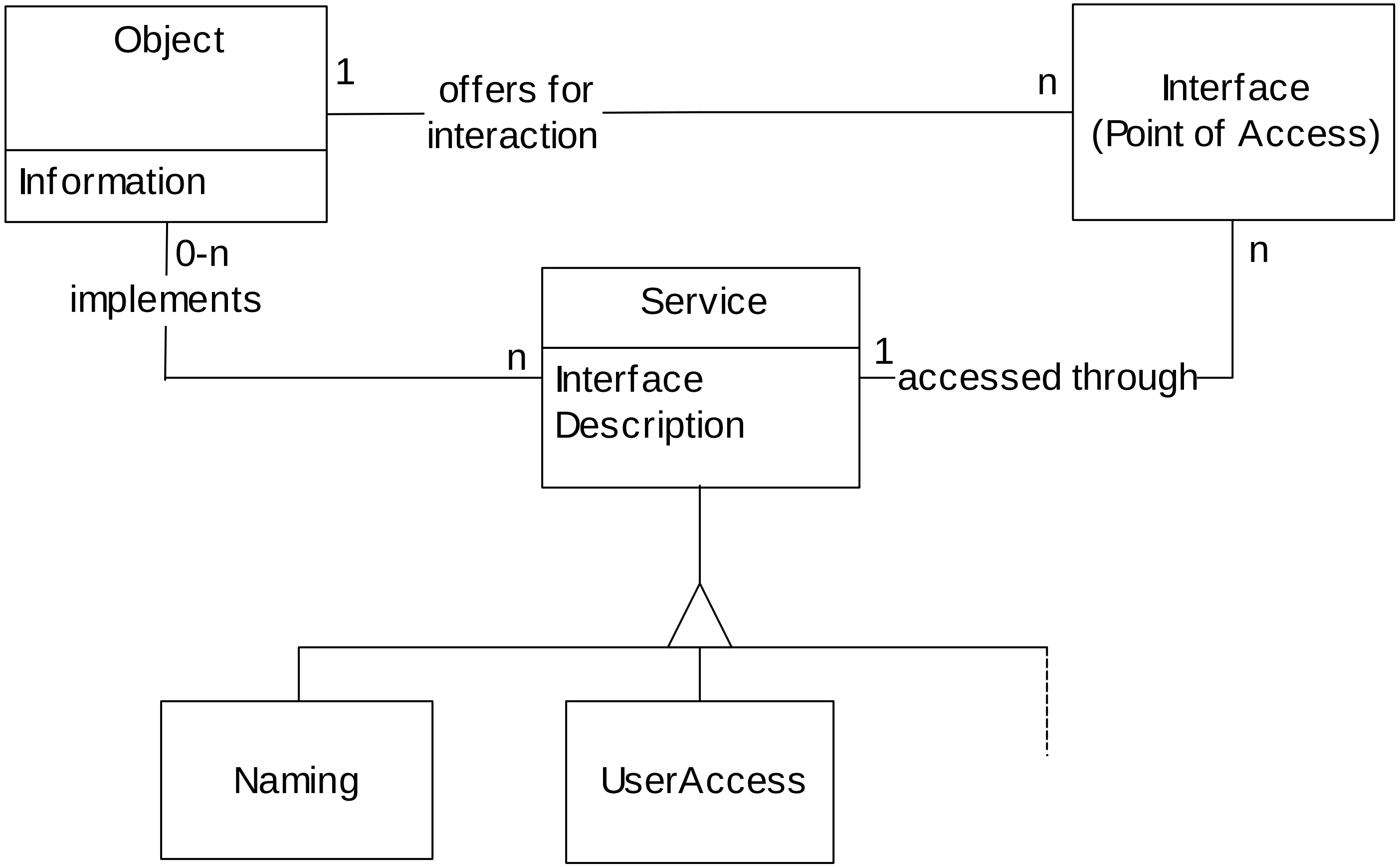
Patterns

- Extract from the work packages re-usable design expertise for use in other projects
- Pattern ::=
  - Name
  - Context
  - Problem
  - Solution
    - Structure of components
    - Guidance on use of pattern
- Reflects componentisation of Java beans

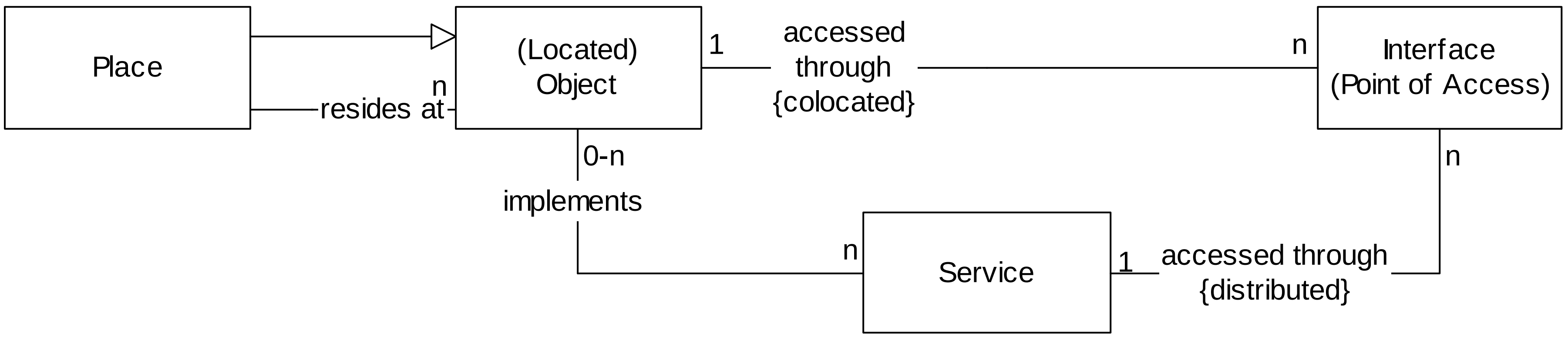
Basic Patterns

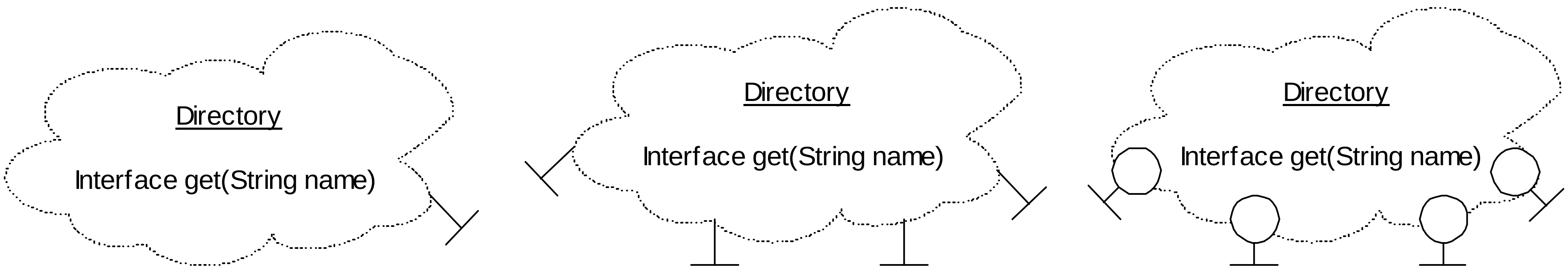
- Objects
- Collective objects
- Object clustering
- Meta objects
- Proxying
- Flavouring
- Reactive object
- Active object
- Autonomous object
- Location transparent reference
- Dynamic binding
- Server
- Factory
- Introspection
- Self-Interpreting data
- Execution vehicle
- Monitored object
- Deployable
- Protocol object
- Service Map
- Service Directory
- Agent

Object, Service and Interface



Object Location and Decomposition


Place
resides at
n
(Located) Object
1
accessed through {colocated}
n
Interface (Point of Access)
0-n
implements
n
Service
1
accessed through {distributed}
n


Directory
Interface get(String name)
Directory
Interface get(String name)
Directory
Interface get(String name)

What Next?

- Dissemination
  - SIGOPS 98, Middleware 98, Mobile Agents 98
- Add patterns as work develops
  - look for generics
- Monitor integration of components
  - ensure interfaces are architectural
  - ensure foundations are adequate
- Monitor industry developments for insight, alignment and opportunities
  - OMG MASIF, Aglets, Voyager, others