



# An Active Fabric for Invisible Computing

ARCADE  
Data-Centric Networking  
Active Fabric

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## REQUIREMENTS TO THE COMMUNICATIONS INFRASTRUCTURE

### ACCOUNTING, TRACING, PRIVACY

- Tracing of data to ensure successful delivery;
- Accounting for provided services;
- Maintaining users' privacy.

### SERVICE MANAGEMENT

- Automatic configuration and management of services;
- Service discovery, binding and dependency management;
- Self-monitoring for fault detection and repair.

### SECURITY

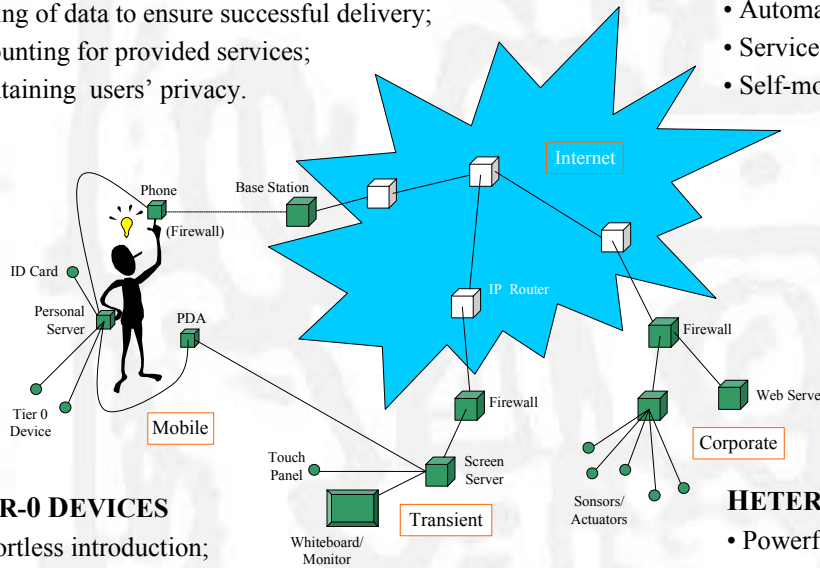
- Immediate authentication of new users;
- Protection for users and services;
- Multiple layers of encryption (frame/payload);
- Secure communication over encrypted tunnels;
- Dynamic, instantaneous creation of tunnels.

### PHYSICAL LAYER TECHNOLOGY

- High-speed Internet links;
- Edge-of-the-network (DSL, ISDN);
- Faster, longer range wireless (GSM);
- Slower, shorter range wireless (RF, IR).

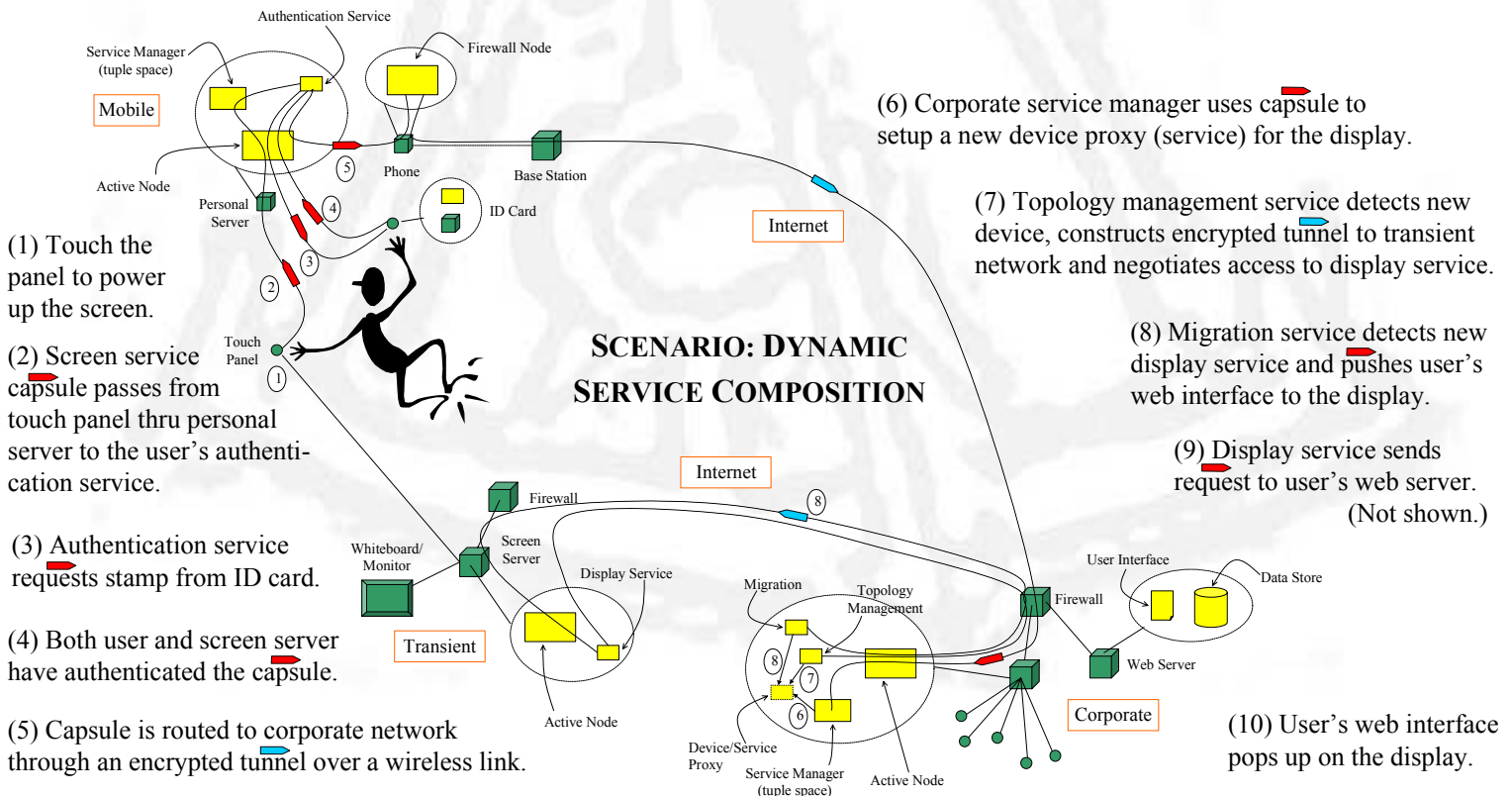
### HETEROGENEITY

- Powerful servers;
- Desktops and laptops;
- PDAs and mobile phones;
- Constellations of tier-0 devices.



### TIER-0 DEVICES

- Effortless introduction;
- Intermittent connectivity;
- Resource limitations.



(1) Touch the panel to power up the screen.

(2) Screen service capsule passes from touch panel thru personal server to the user's authentication service.

(3) Authentication service requests stamp from ID card.

(4) Both user and screen server have authenticated the capsule.

(5) Capsule is routed to corporate network through an encrypted tunnel over a wireless link.

(6) Corporate service manager uses capsule to setup a new device proxy (service) for the display.

(7) Topology management service detects new device, constructs encrypted tunnel to transient network and negotiates access to display service.

(8) Migration service detects new display service and pushes user's web interface to the display.

(9) Display service sends request to user's web server. (Not shown.)

(10) User's web interface pops up on the display.

Work in progress

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