# Security, Privacy, and the Next Generation Internet

**Michael R. Nelson**
**Director, Internet Technology & Strategy**
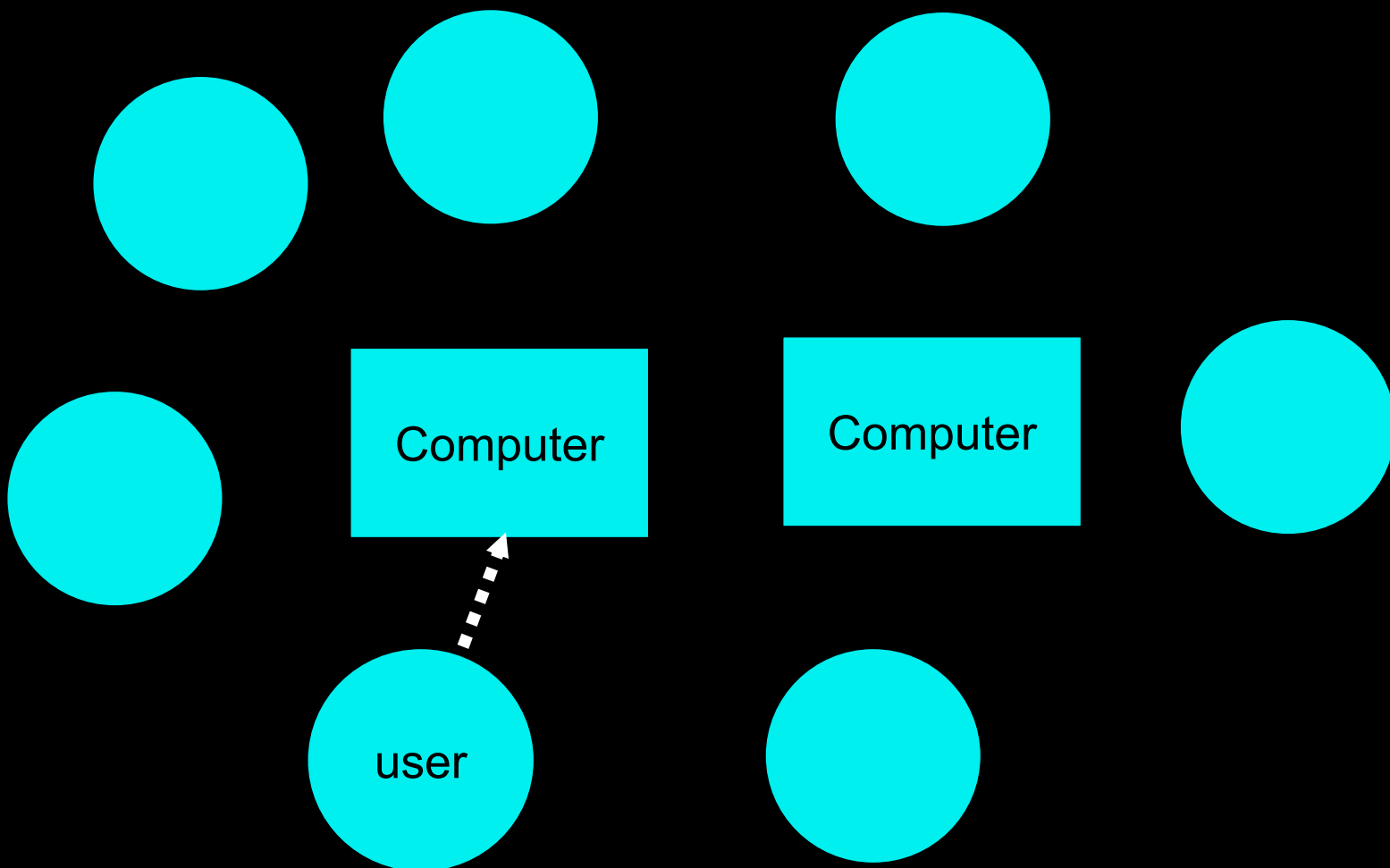**IBM Corporation**
**MRN@US.IBM.COM**

# My Background

- **B.S., geology, Caltech**
- **Ph.D., geophysics, MIT**
- **1988 -- Congressional Science Fellow**
- **4 years as Senator Gore's science advisor**
- **4 years as IT policy wonk at White House**
- **1998-1999 -- Technologist at FCC**
- **8 years at IBM**
- **Industry Strategy Council, Internet2**
- **Former Chairman, TPRC**
- **VP, Public Policy, Internet Society**
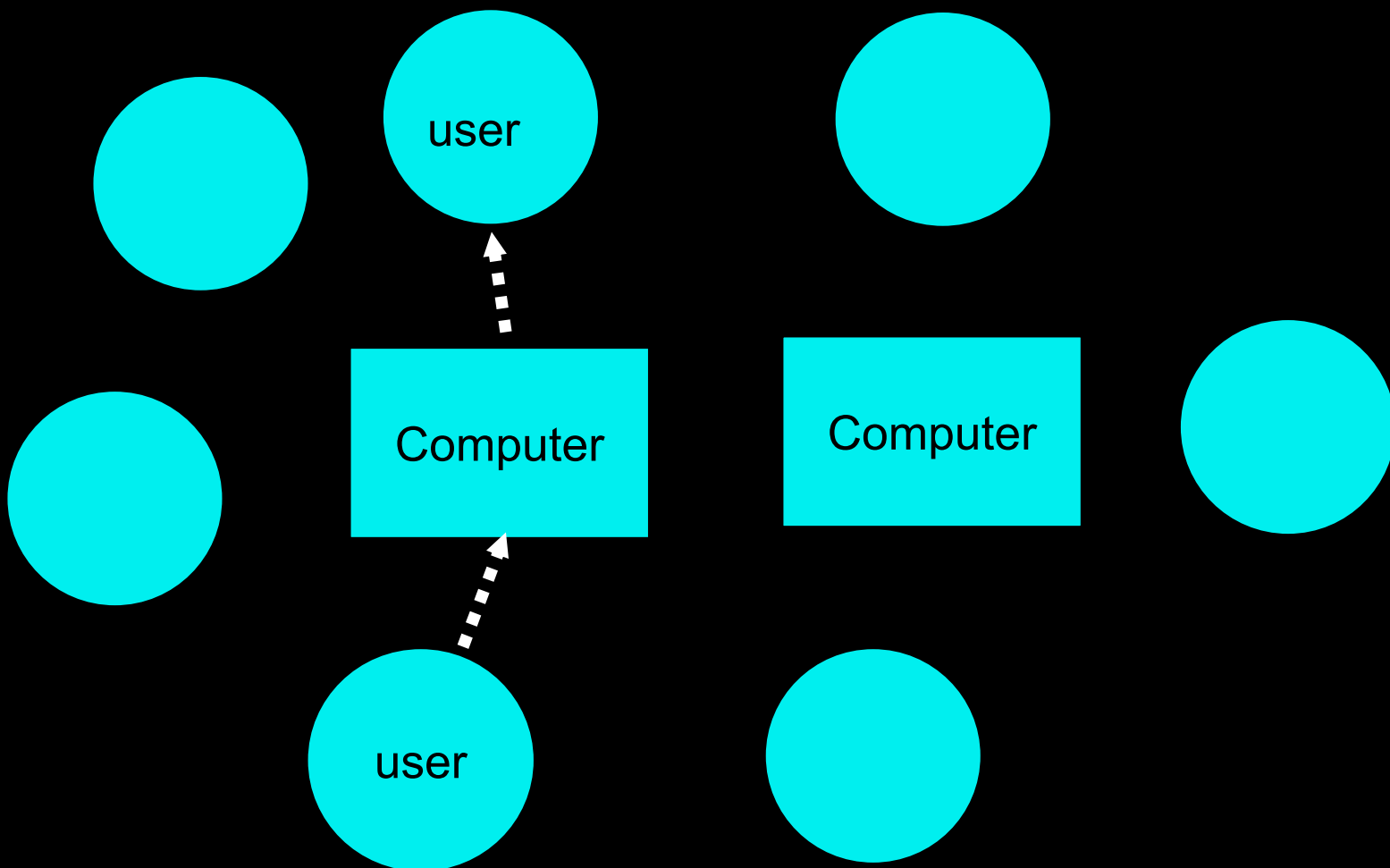
# Entering the Third Phase of the Internet

**Many different pieces**
- **Web 2.0**
- **Web Services**
- **WiFi, WiMax, and more**
- **The "Internet of Things" (sensors, etc.)**
- **Service-Oriented Architecture**

# Phase One – Remote Log-in – One-to-One

Computer

Computer

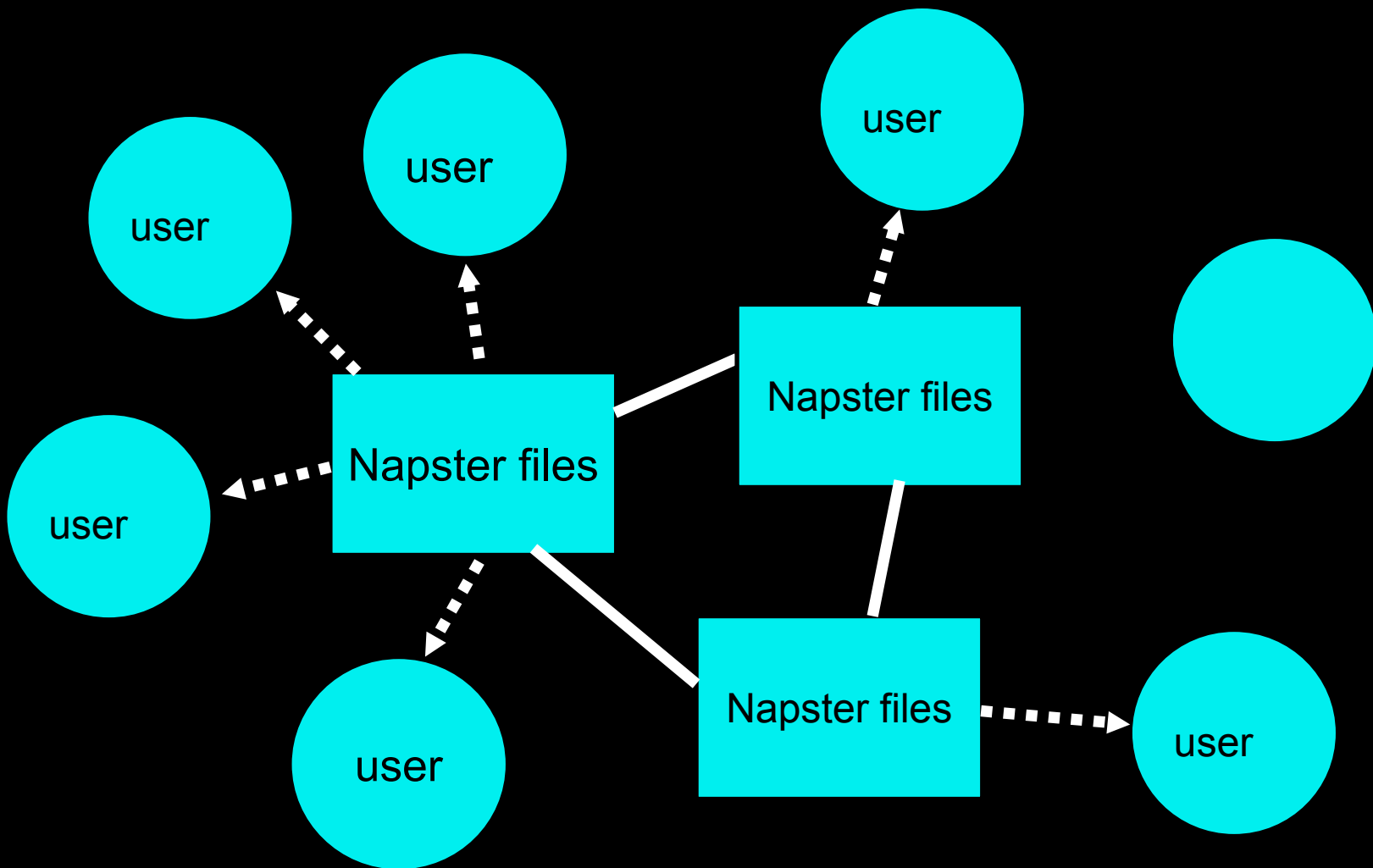user

# Phase One – E-mail – One-to-One

# Phase Two – Web – One-to-Many
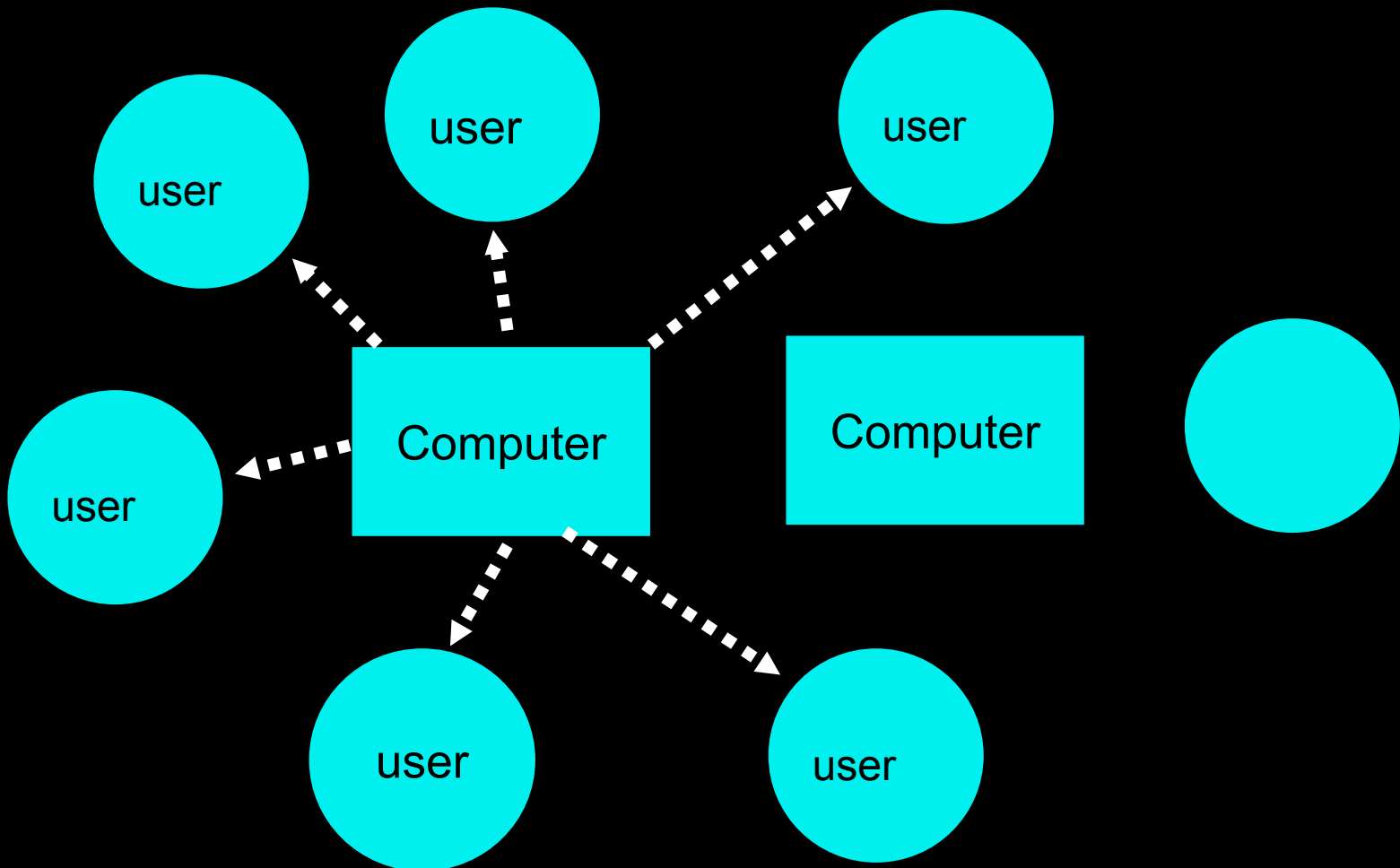
# Phase Three – Napster – Many-to-Many

user

user

user

user

Napster files

Napster files

Napster files

user

user

# Phase Three – Grid – Many-to-Many
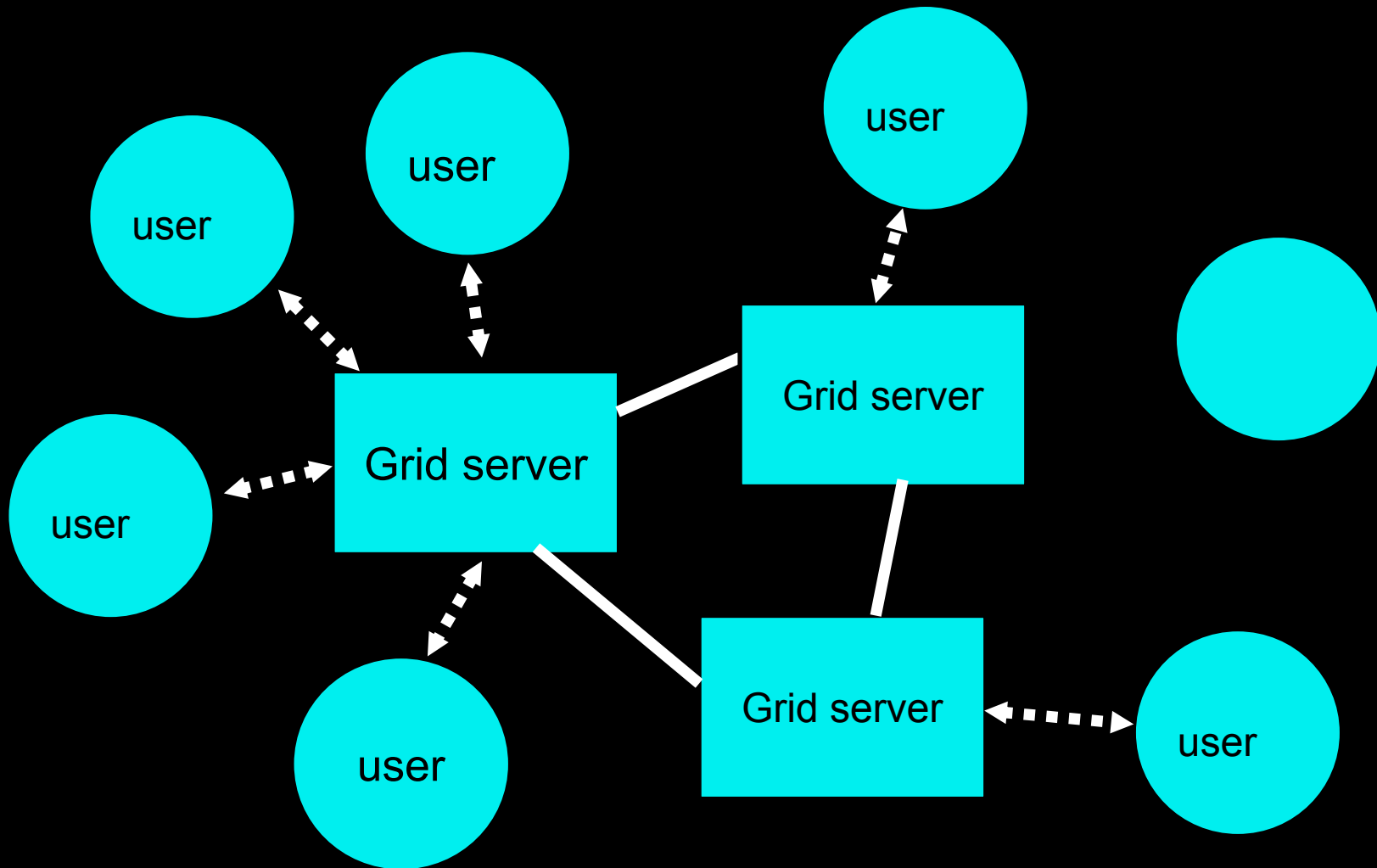
# Phase Three – SOA – Many-to-Many

# Value Networks



Trust (vertical axis)

Collaboration (horizontal axis)

**1** Isolated Operations

**2** Select 'Trusted Partners'

**3** Value Chain Visibility

**4** Industry-Centric Value Web

**5** Cross-Industry Value Coalition

**Legend**

- 🟡 Core Business
- 🟡 Subsidiary
- 🟢 Customer
- 🟤 Partner/Channel
- 🔵 Supplier/Outsourcer
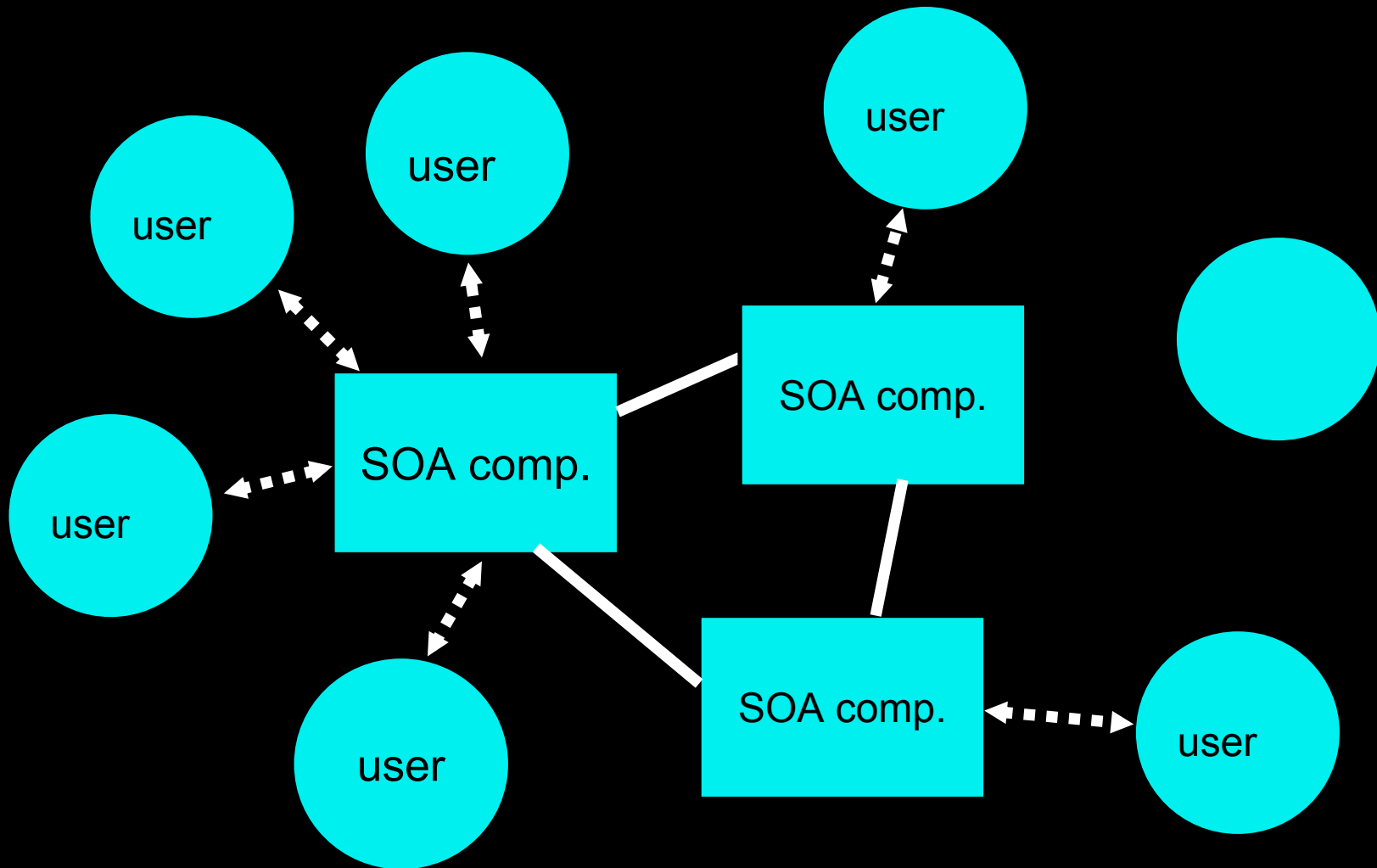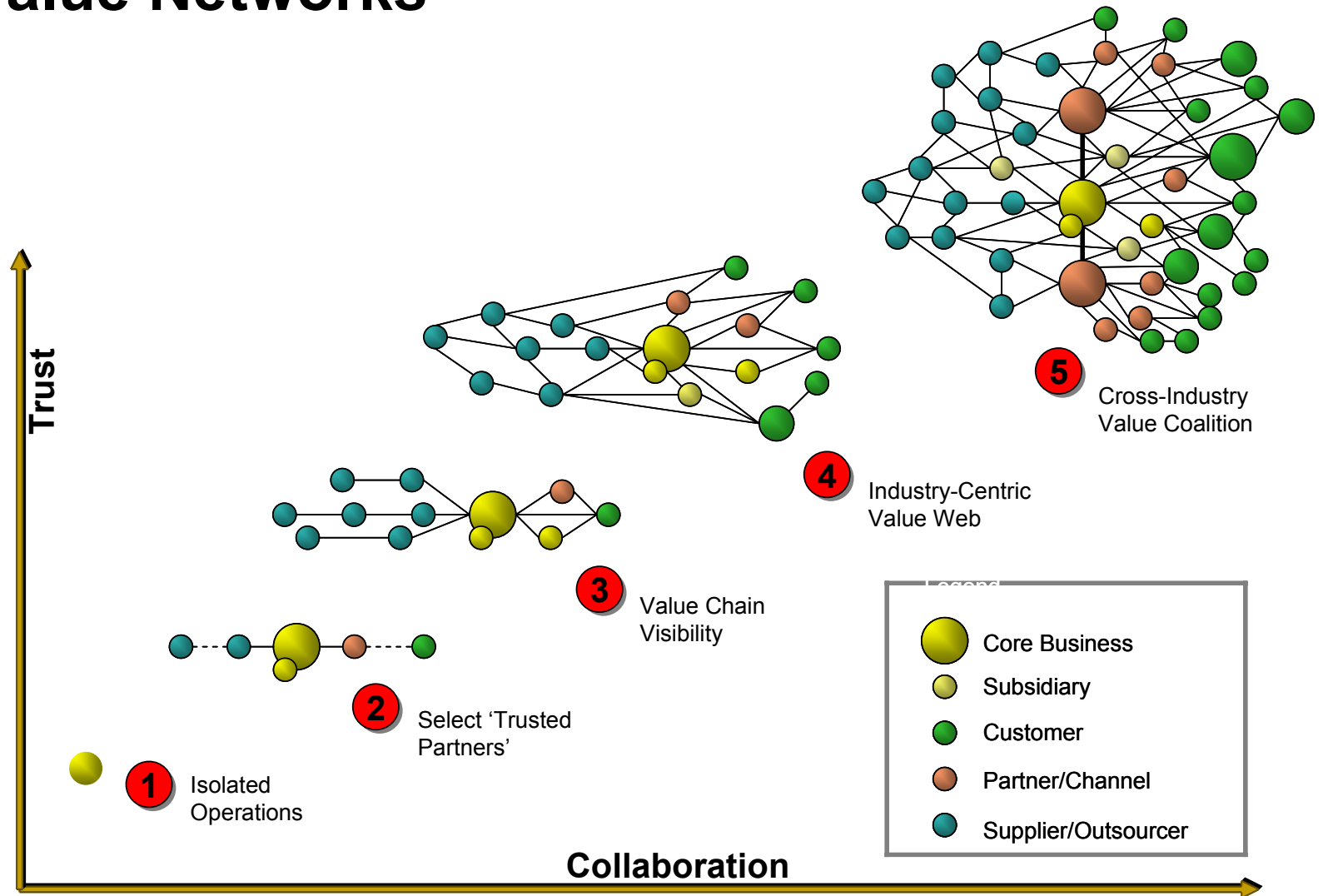
# Value Networks and Information Sharing

**Trust?**

**End of privacy?**

**OR**

**End of information sharing?**

**OR**

**???**

**Web 3.0**

**Web 2.0**

**Free sharing**

**Web 1.0**

**Systematic sharing**

**Internet**

Cross-In
Value Co

Industry-Centric
Value Web

Value Chain
Visibility

**Intranet**

**Limited sharing of personal information**

Select 'Trusted Partners'

Isolated

**Data center**

**Sharing of PII becomes the standard as services provide adequate value for the data they collect.**

**Collaboration**

1) Privacy Notice

2) Authentication

3) Authorization

4) Data collection

COLLECTION

APPLICATION

5) Use

10) Track

7) Discovery

6) Store
Protect
Minimize

9) Disclose

8) Contract

PARTNER

8) Contract

STORAGE

9) Disclose

10) Track

10) Track

AUDIT
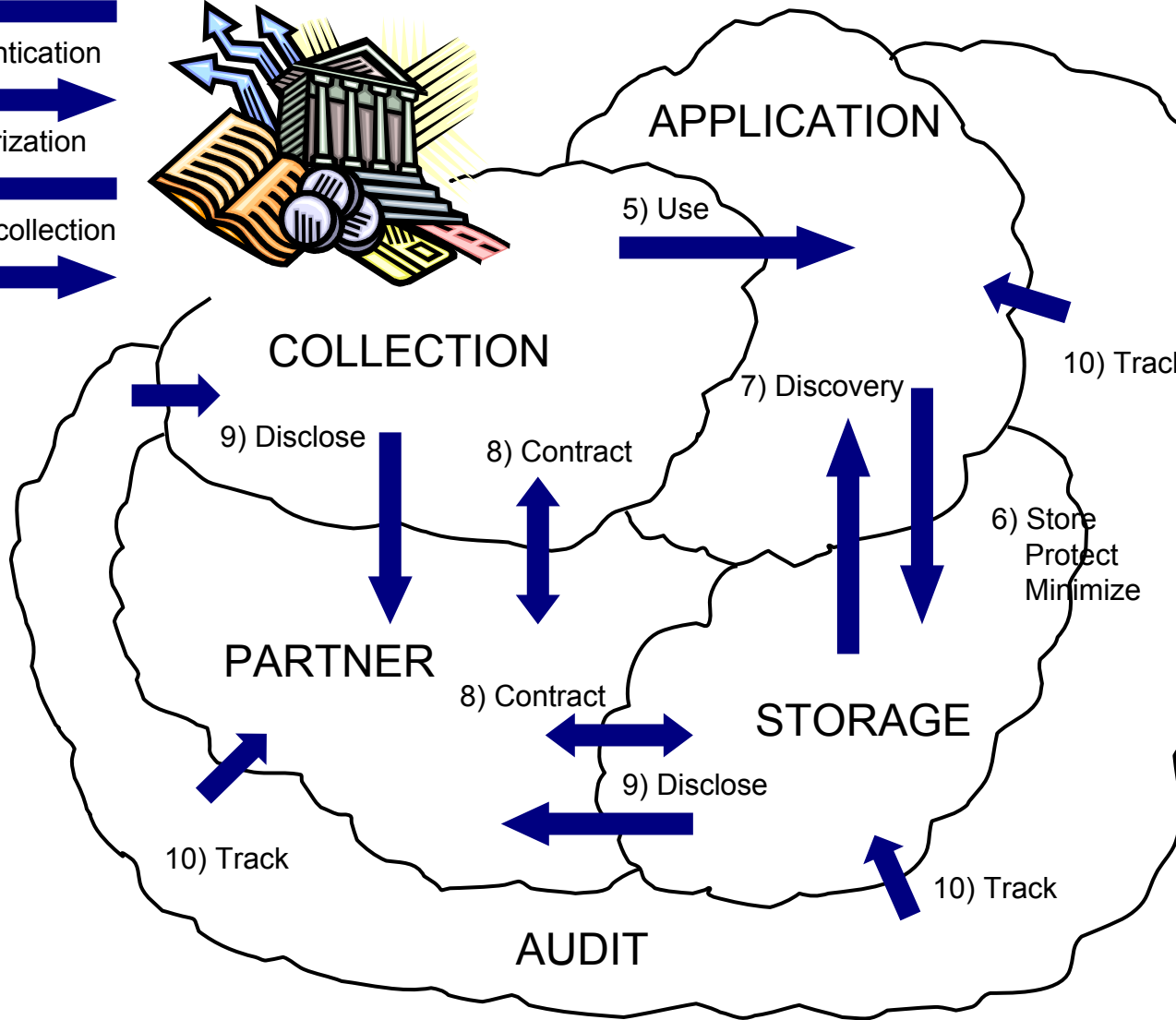
# Critical technology choices

- **Authentication and directories**
- **Privacy-enhancing technologies (P3P)**
- **Open Document Format**
- **Digital Rights Management**
- **Filtering technologies to block spam, porn**
- **Voice over IP**
- **Wireless Internet standards**
- **Service-Oriented Architecture (SOA) and Grid computing**
- **Instant messaging**
- **IPv6 deployment**
- **Linking the phone network and the Internet**
- **Rich media standards (SIP, multicast, etc.)**
- **End-to-end vs. walled gardens**

# Policy-Legal-Regulatory Ecosystem

**ITU Convention Int'l Telecom Regs**

PP2006   [WCIT]

**Cybercrime Convention Signatories & Justice Ministers**

**Other multilateral and bilateral agreements**

**Commission of the European Community**

Parliament   Council

Infso   JHA

**APEC-TEL**

NGN WG   NGN reg

eSec TG

**CITEL**

PCC.I

WGSC   WGANTS

**Germany**

BNETZA-T   BfV

**UK**

Parliament   Home Office

DTI   OFCOM

**USA**

NSTAC

FCC

DHS

NANC   DOJ   DOS   DOC

**Australia**

ACA   Parliament

ASIO

**France**

ARCEP   Justice

**Netherlands**

EZ   CIOT

Justice

**Canada**

Industry Canada   PSECP

**Many Others**

Tony Rutkowski, Verisign, ITU NGN workshop, March 2006

# Ten P's of Cyber-policy

**Privacy**
**Piracy**
**Pornography**
**Protection**
**Pricing**
**Policing**
**Psychology**
**Procurement**
**Payments**
**Protectionism**

# Tech answers to policy problems

| | |
|---|---|
| **Privacy** ⟶ | **P3P, etc.** |
| **Piracy** ⟶ | **DRM** |
| **Pornography** ⟶ | **Filtering tech.** |
| **Protection** ⟶ | **Authentication** |
| **Pricing** ⟶ | **Grid standards** |
| **Policing** | **Wireless Internet** |
| **Psychology** | **Phone-Net merger** |
| **Procurement** | **Voice over IP** |
| **Payments** | |
| **Protectionism** | |