# Implementing Agile Development: A Case Study

## Air Force Network Integration Center

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### 10 August 2012

- **Setting the Stage**
- **Our Task**
- **Rationale for Choosing Agile**
  - **Scrum Methodology**
  - **ANGI SIL Scrum Implementation**
- **Implementation**
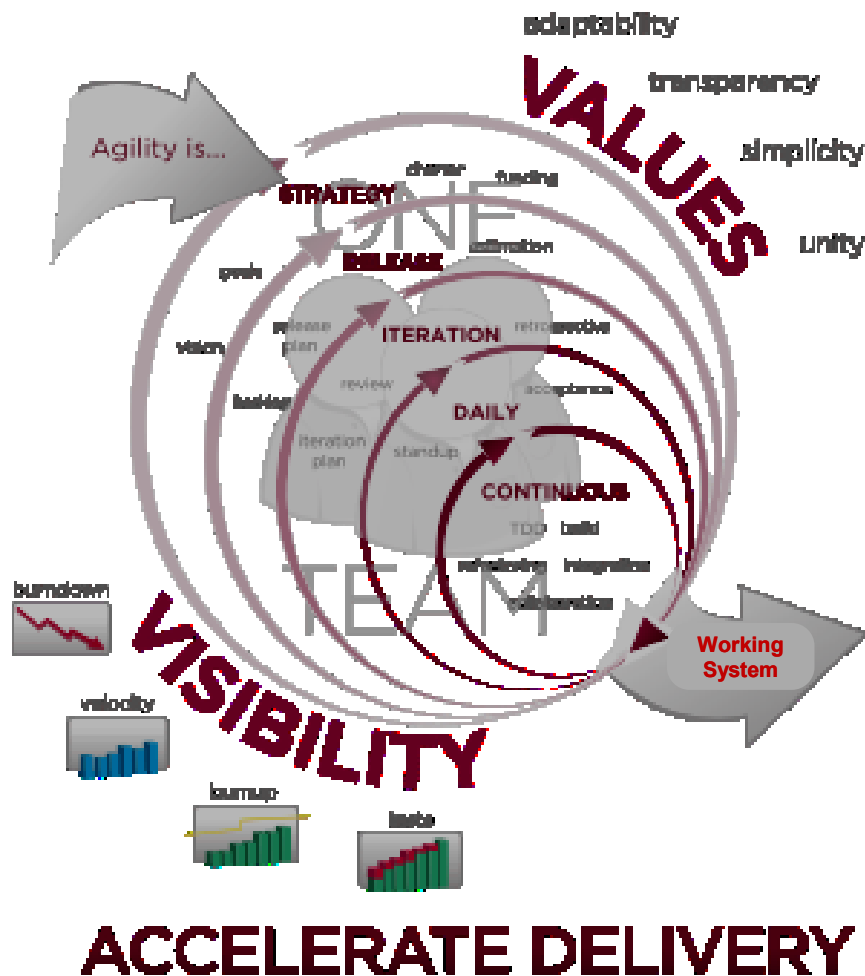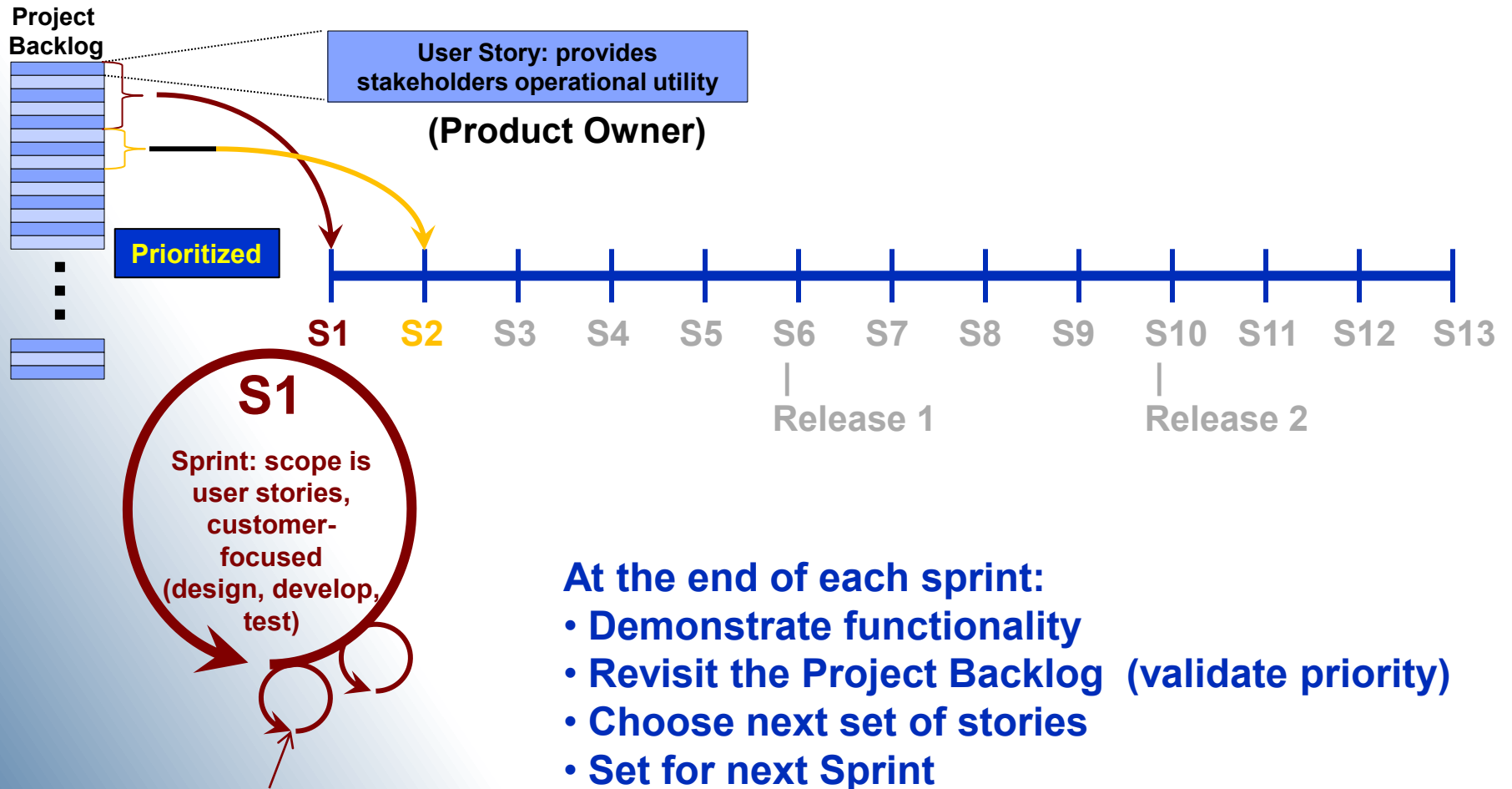- **Impediments**
- **Results**
- **Lessons Learned**

**MAF C2 Improvement**

**Combat Comm**

**Needed a development methodology that would allow the team design flexibility and be responsive to evolving requirements.**
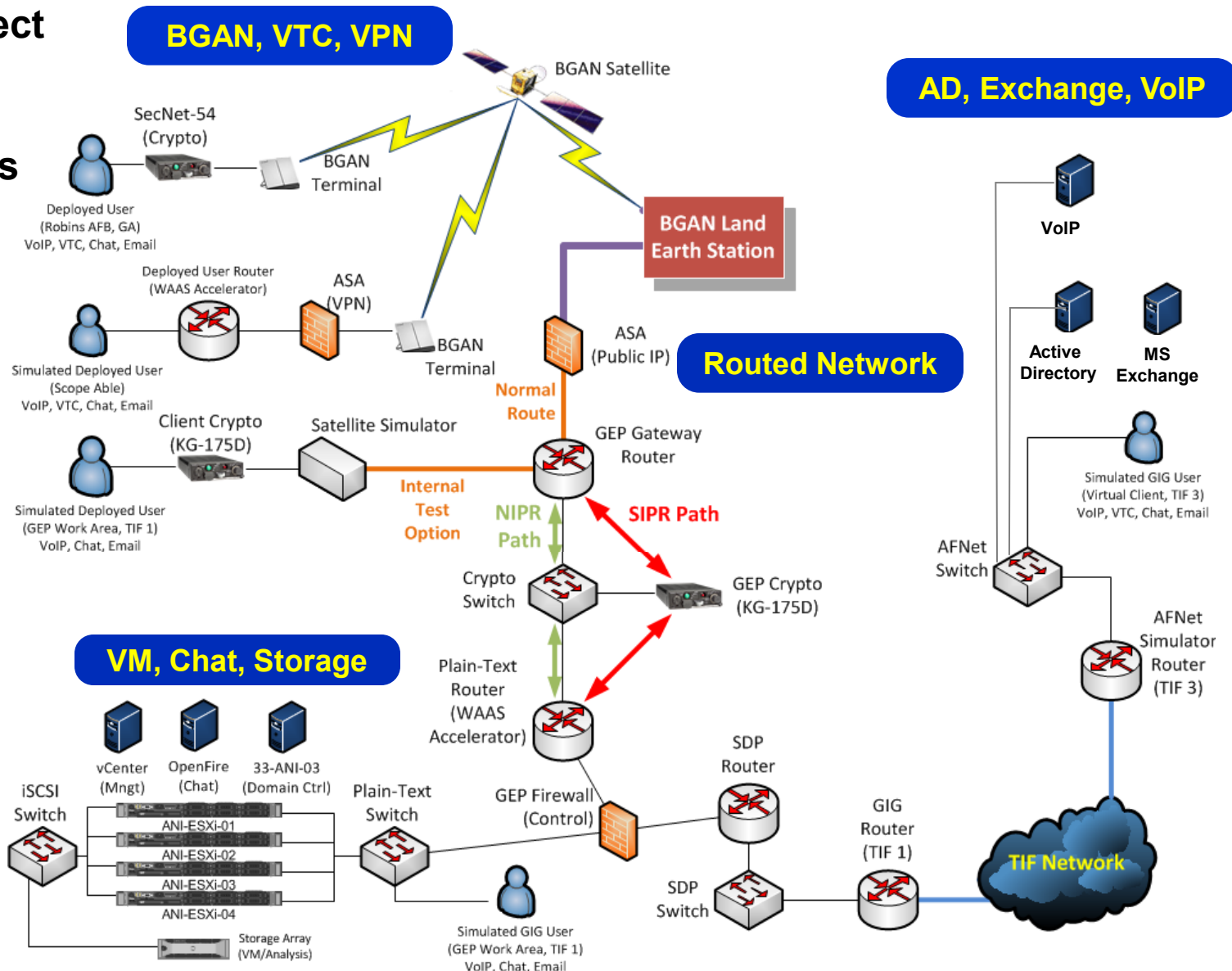
- **Environment**
  - **Need for flexibility**
  - **Immature requirements**
- **Traditional methods**
  - **Too long**
  - **Not meet requirements**
- **Agile would give us**
  - **Minimized planning**
  - **Short iterations**
- **Develop effective capability/optimize schedule**

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**Project Backlog**

User Story: provides stakeholders operational utility

**(Product Owner)**

**Prioritized**

S1  S2  S3  S4  S5  S6  S7  S8  S9  S10  S11  S12  S13

Release 1    Release 2

**S1**

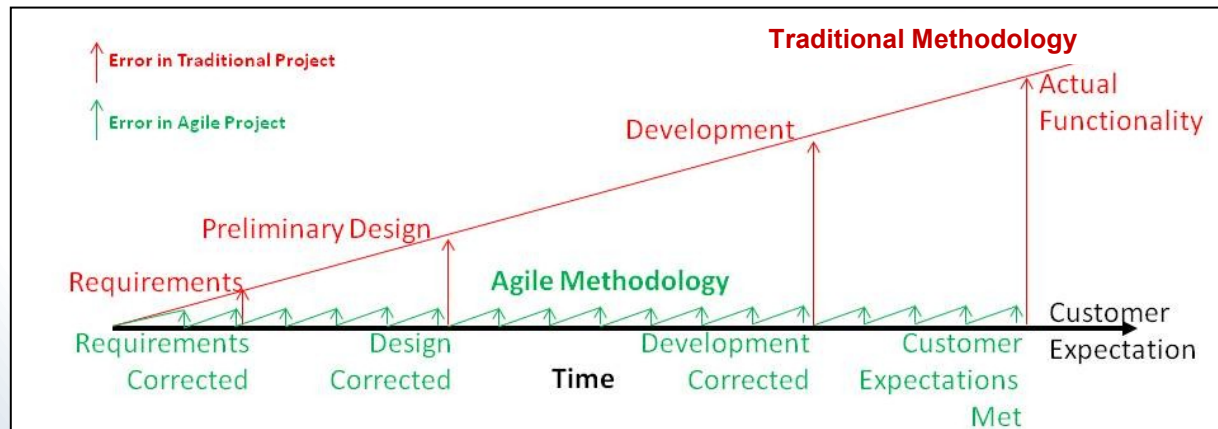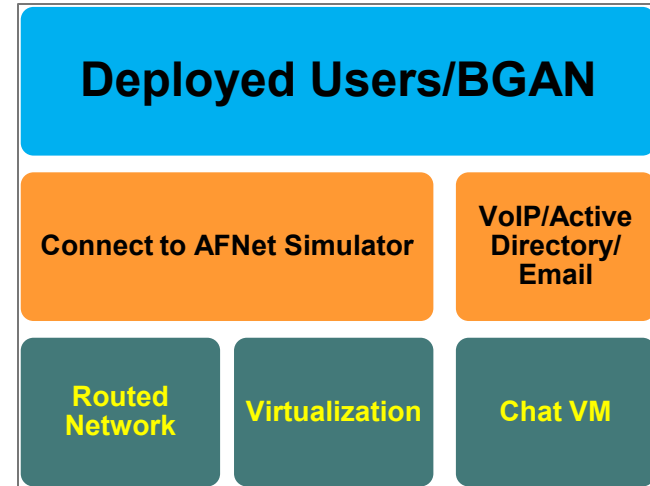Sprint: scope is user stories, customer-focused (design, develop, test)

**At the end of each sprint:**
- **Demonstrate functionality**
- **Revisit the Project Backlog  (validate priority)**
- **Choose next set of stories**
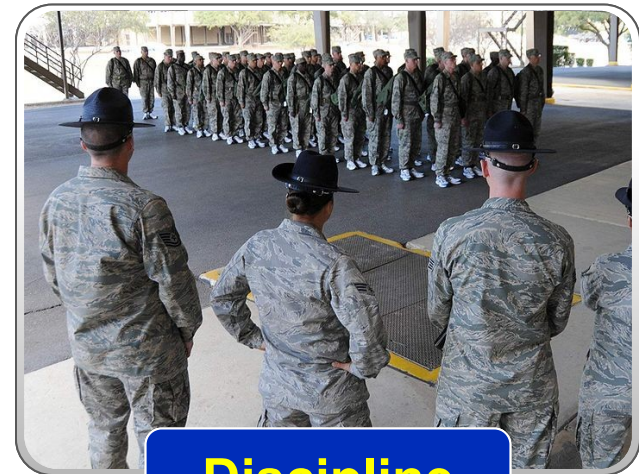- **Set for next Sprint**

**Daily Scrum (standup), team-focused:**
- **What did you accomplish yesterday?**
- **What will you accomplish today?**
- **Are there any roadblocks?**

- **Initiated project January 2012**
- **Team**
  - **4 engineers**
  - **Product Owner**

**BGAN, VTC, VPN**

**AD, Exchange, VoIP**

**Routed Network**

**VM, Chat, Storage**

BGAN Satellite

SecNet-54 (Crypto)

Deployed User (Robins AFB, GA) VoIP, VTC, Chat, Email

BGAN Terminal

BGAN Land Earth Station

VoIP

Active Directory

MS Exchange

Deployed User Router (WAAS Accelerator)

ASA (VPN)

BGAN Terminal

ASA (Public IP)

Simulated Deployed User (Scope Able) VoIP, VTC, Chat, Email

Client Crypto (KG-175D)

Satellite Simulator

**Normal Route**

GEP Gateway Router

Simulated GIG User (Virtual Client, TIF 3) VoIP, VTC, Chat, Email

Simulated Deployed User (GEP Work Area, TIF 1) VoIP, Chat, Email

**Internal Test Option**

**NIPR Path**

**SIPR Path**

AFNet Switch

Crypto Switch

GEP Crypto (KG-175D)

AFNet Simulator Router (TIF 3)

vCenter (Mngt)

OpenFire (Chat)

33-ANI-03 (Domain Ctrl)

Plain-Text Router (WAAS Accelerator)

iSCSI Switch

ANI-ESXi-01

ANI-ESXi-02

ANI-ESXi-03

ANI-ESXi-04

Plain-Text Switch

GEP Firewall (Control)

SDP Router

GIG Router (TIF 1)

**TIF Network**

SDP Switch

Simulated GIG User (GEP Work Area, TIF 1) VoIP, Chat, Email

Storage Array (VM/Analysis)

- **Flexibility**
  - **Built generic network simulation in stages**
  - **Allowed us to build simulator while deployed user requirements matured**

- **Accuracy**
  - **Quote from Combat Comm (Sprint #15, mid-May), "… that's exactly what we needed…"**

- **Feedback (shorter iterations)**
  - **Demonstrated functionality more often**
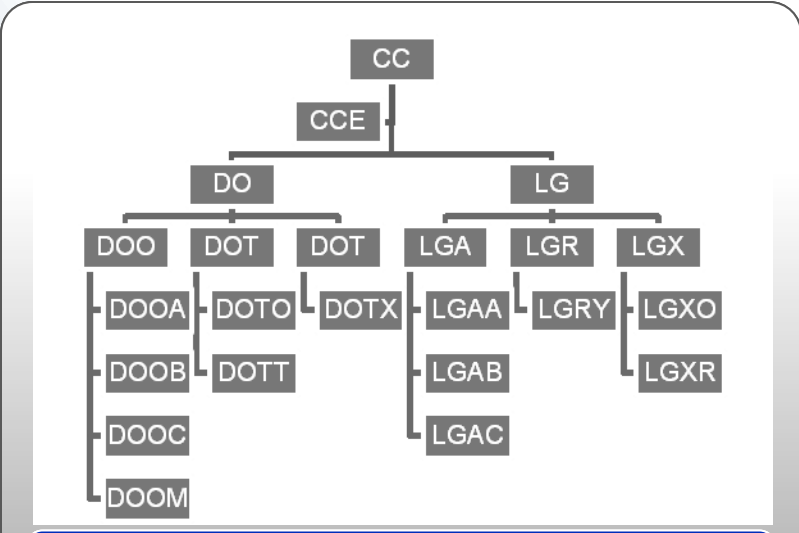  - **Responded to evolving requirements**



Deployed Users/BGAN

Connect to AFNet Simulator | VoIP/Active Directory/Email

Routed Network | Virtualization | Chat VM



Error in Traditional Project
Error in Agile Project
Traditional Methodology
Actual Functionality
Development
Preliminary Design
Requirements
Agile Methodology
Requirements Corrected
Design Corrected
Development Corrected
Customer Expectations Met
Time
Customer Expectation

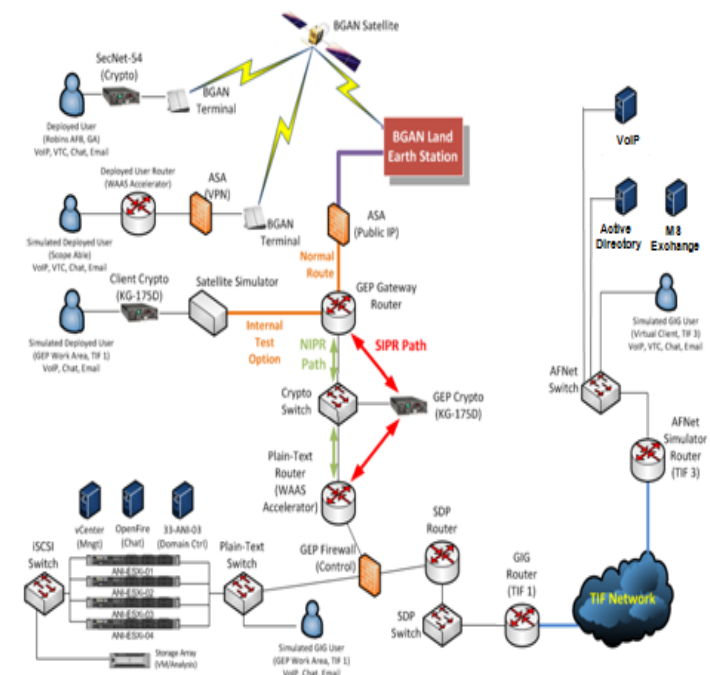**Discipline**



**External Organizations**



**Organizational Inertia**

- **AFNIC:**
  - **Deeper understanding of Combat Comm mission**
  - **Delivered correct functionality the first time**





- **Combat Comm:**
  - **Quicker feedback (working functionality)**
  - **Sharper understanding of ANGI capability**
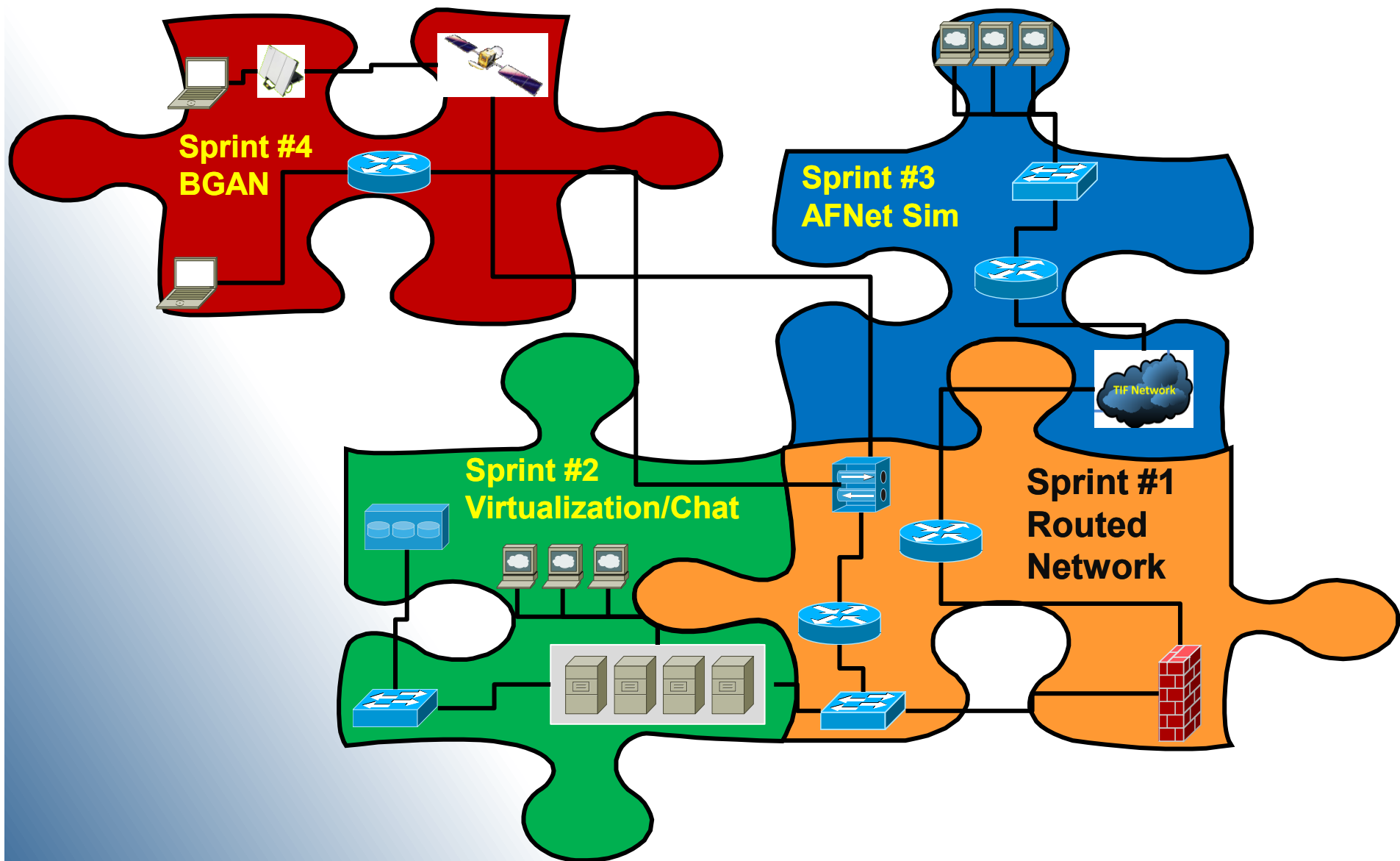
AFNIC

**Education**



**Discipline**



**Commitment**



**Tactical Deviation**



**Interdependency**



ESC

AFSPC

AFNIC

Sprint #4
BGAN

Sprint #3
AFNet Sim

Sprint #2
Virtualization/Chat

Sprint #1
Routed Network

TIF Network

**AFNIC**

- **AFNIC Customer Contact**
  - **AFNIC/XPN**
  - **afnic.xp.customersupport@us.af.mil**
  - **618-229-5846**
- **ANGI Information on our milSuite landing page**
  - **https://www.milsuite.mil/book/groups/airborne-network-gig-interface**

# Innovation…The AFNIC Advantage