#### UAVs as Communications Routing Nodes in Network-Centric Warfare



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#### Agenda



#### Introduction

- Common Data Link
- Unmanned Aerial Vehicles as
  Communications Nodes
- Data Network Protocols
- Managing the UAV Platform in an Autonomous, Self-Healing Network
- Summary

## L-3 Communications Systems-Westcommunications



- High speed wireless data links
- High bandwidth and robust operation in hostile environments
- Enabling fast decision loops
- Multiplying force
  effectiveness
- Data links become increasingly valuable

## **Linking Sensors and Shooters**





## **Network Centric Warfare**





# **Evolving CDL Specifications**





## **CDL Interoperability**





## **Simple Point to Point Data Link**





#### **CDL – Data Links to Data Networks**





The information contained herein is generally accessible or available to the public as described in the ITAR 22CFR 120.11.

### **Data Links to Data Networks**





Supporting a DoD Network-Centric Transformational Communications Strategy

## **UAV Relay**





## **UAV Relay**





## **UAV Relay**





## **UAV as Surrogate Satellite**





## **UAV Communications Bridge**





- Deep reconnaissance missions
- Supports dissimilar radios
- Provides line of sight extensions



## **UAV** Broadcasting





## **Networking UAV Payloads**



- Remote network equipment or payload sensor management and monitoring
- Can implement standard user control interfaces such as HP OpenView
- In flight maintenance actions from anywhere on the network

>Start



### **RF Media Access Manager**



- Relative node position calculations
- Antenna pointing
- Channel assignments
- Handles a hostile environment recognizing jamming and physical assault
- Link outage management
- Topology Management
- Quick Convergence

## **Complementary Layers**





## **Emerging NCW Technologies**



- Software Programmable Data Links
- Multi-beam Antennas
- Smaller, Lighter Communications Equipment
- Lower Power Consumption
- More Secure Communications
- Easier to Manage Links
- Self Healing Networks
- Automatic Network Discovery with Authentication
- Seamless Roaming
- Constant Connectivity

#### Summary



#### • UAVs

- ISR & C Platforms
- Move the switching and routing backbone into the sky
  - Flexible
  - Reliable
  - Durable
  - Manageable
- Easier to deploy
- Connects widely dispersed forces
- Covers fast-paced operations
- No ground backbone to maneuver

# Backup Slides





## UAV as a Gateway





#### **Notional Communications Gateway**





## **UAV** as a Router



