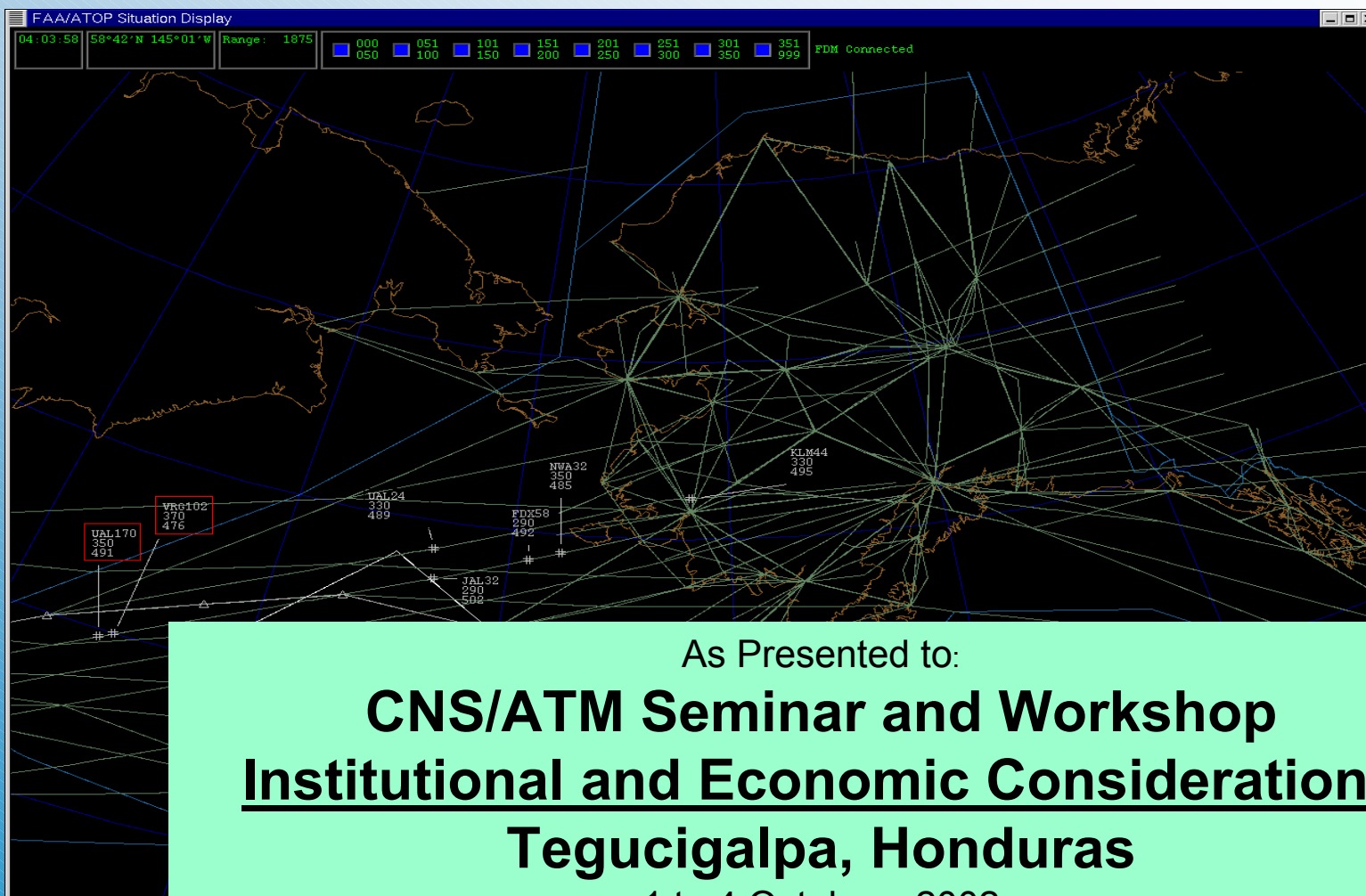




ACC Functionalities and Architectures



As Presented to:

CNS/ATM Seminar and Workshop
Institutional and Economic Considerations
Tegucigalpa, Honduras
1 to 4 October, 2002



Briefing Outline

- ***AERALIB***[®]
- ***Atom***tm
- ***Attila***tm

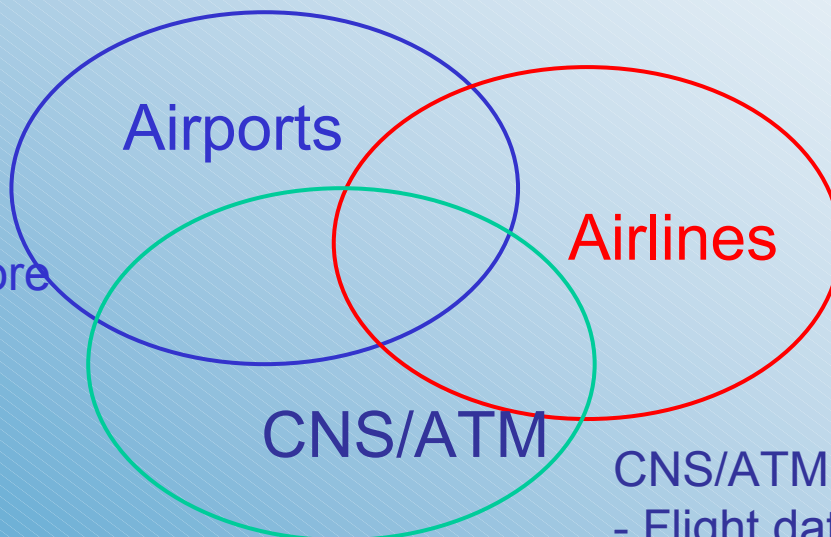
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Air Transport Integration

Airports

- Infrastructure
- FIDS
- Resource optimization
- Billing and more



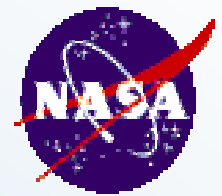
Airlines

- Resource optimization
- Baggage management
- Gate allocation
- Aircraft movement
- Tickets, security, laws, and more

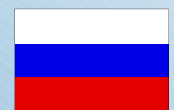
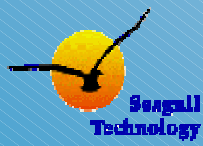
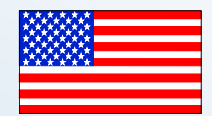
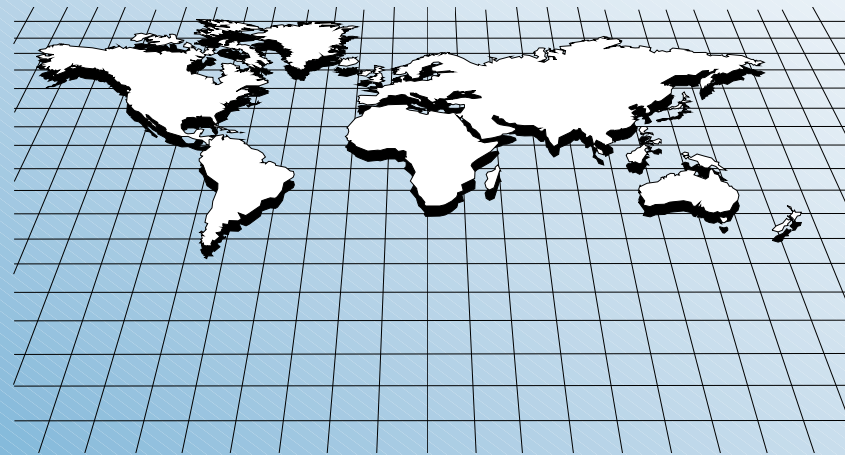
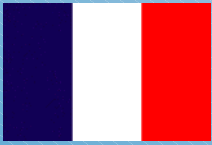
CNS/ATM

- Flight data management
- Flight service & following
- Operator display systems
- Conflict prediction & resolution
- Administration, billing, and more

AERALIB®



Eurocontrol



Atomtm

Atomtm Operational CNS/ATM Family



*..a state of the art air traffic control system,
available off the shelf ..*

- **Atomtm** flight data management
- **Atomtm** Kinematics
- **Atomtm** **AFTN**

Atomtm

State of the art design



.. a next generation Air Traffic Management system built from the ground up to meet today's needs as well as tomorrow's ..

- Flexible and Complete
- Modular design with plug in upgrades
 - buy only what you need when you need it
- Risk Free Business Case

Atomtm



State of the Art Design

- Multi-Sensor Surveillance
- Variable 4d Conflict Prediction
- Fully Distributed Architecture
- State of the Art Human Interface
- Readily Available COTS Hardware
- Modern Software Environment
- Freeflight Capable

*Atom*TM

Flexible and Complete

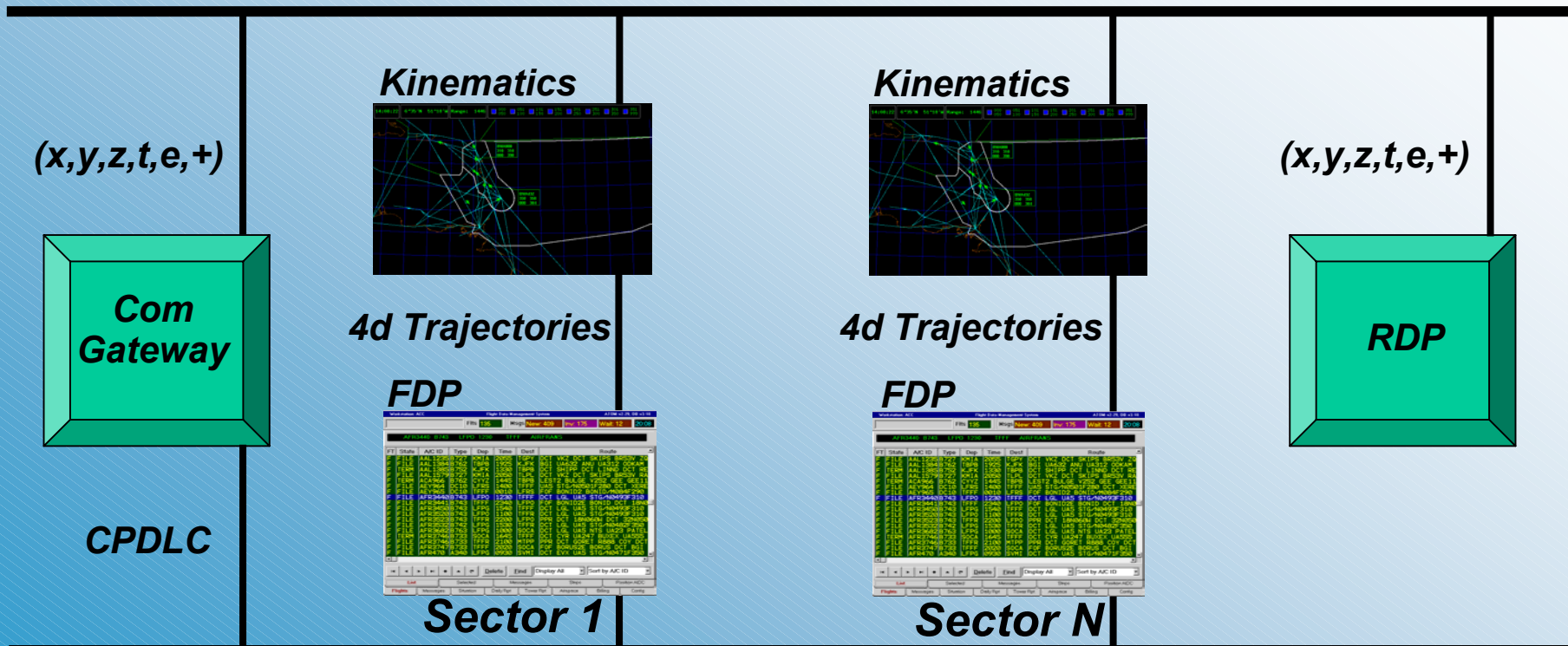


- Centers
- Towers
- AIS Support
- Flight Service
- Arrivals/Departures Display
- User-fee billing
- ICAO Reporting
- Administration



AtomTM End State Configuration

Surveillance Network (x,y,z,t,e,+)



Flight Data Network

AtomTM

Flight Data Manager



- Message Processing and Correction
- Flight Plan Data Base (SQL)
- Route Conversion
- System Configuration (Sectorization)
- System Adaptation (Dynamic)
- Automated Strip Printing
- Beacon Code Allocation
- Billing and Administrative Functions

Atomtm

User Fee Billing



- Enroute or Airport - any number of parameters. Examples:
 - Miles flown in differently priced airspace
 - Aircraft characteristics (Max T/O wt., etc)
 - Time on the ground, in differently priced parking areas
 - Adaptable software to use local rules



ICAO Reporting

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
AIR TRANSPORT REPORTING FORM
AIRPORT TRAFFIC**

Contact person:					
Organization:					
Tel:					
Fax:					
E-mail:					

Description a	Aircraft Movements Total b	Passengers				Loaded g
		Embarked c	Disembarked d	Total (Col.c+d) e	Direct transit f	
Month : 						
A. Commercial air transport						
1. International scheduled						
2. International non-scheduled						
3. Total International(1+2)						
4. Domestic scheduled and non scheduled						
5. Total Commercial air transport(1+2+4)						
6. All-freight/mail services*						
B. All other movements						

AtomTM Kinematics



- Situation Display
- Matching of flight data and radar beacon returns
- Tracking
- Conflict Probe
 - A/C vs. A/C
 - A/C vs. Airspace
- Conformance Monitoring



- Air Traffic Services Interfacility Data Communications (AIDC)
- ICAO flight data message set used to coordinate flights across boundaries without voice comms
- Increased accuracy and speed of data transfer
- Advance Boundary Information messages can give information about incoming flights well ahead of transfer time
- Uses reliable message protocol, even over existing AFTN



- AFTN and AMHS messages
- Upward compatible with the ATN



The Attilatm

.. Attilatm is a computer aided decision process which dynamically optimizes aircraft flow..

- Global - Considers all aircraft and airspace**
- Dynamic - Operates continuously**
- Goal Driven - Optimizes multiple parameters against client's business plan**

Atomtm



Attilatm

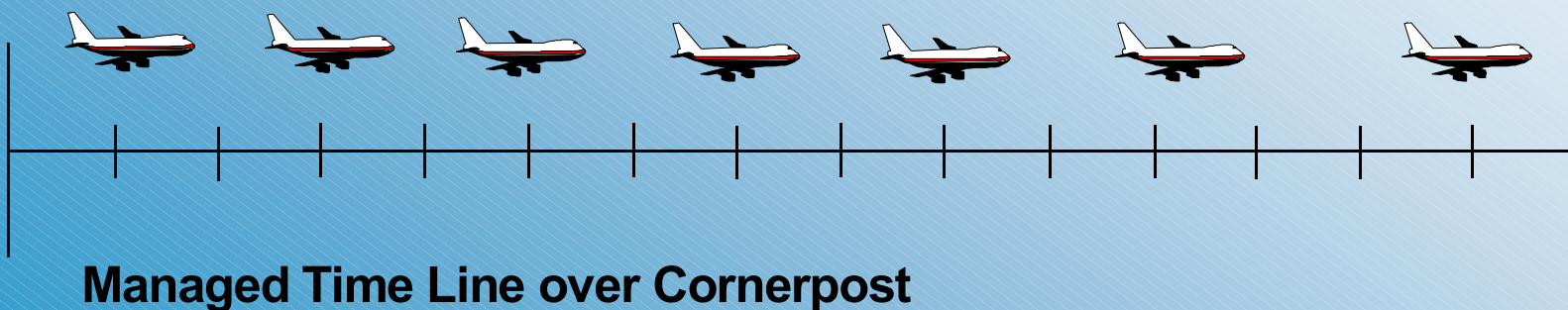
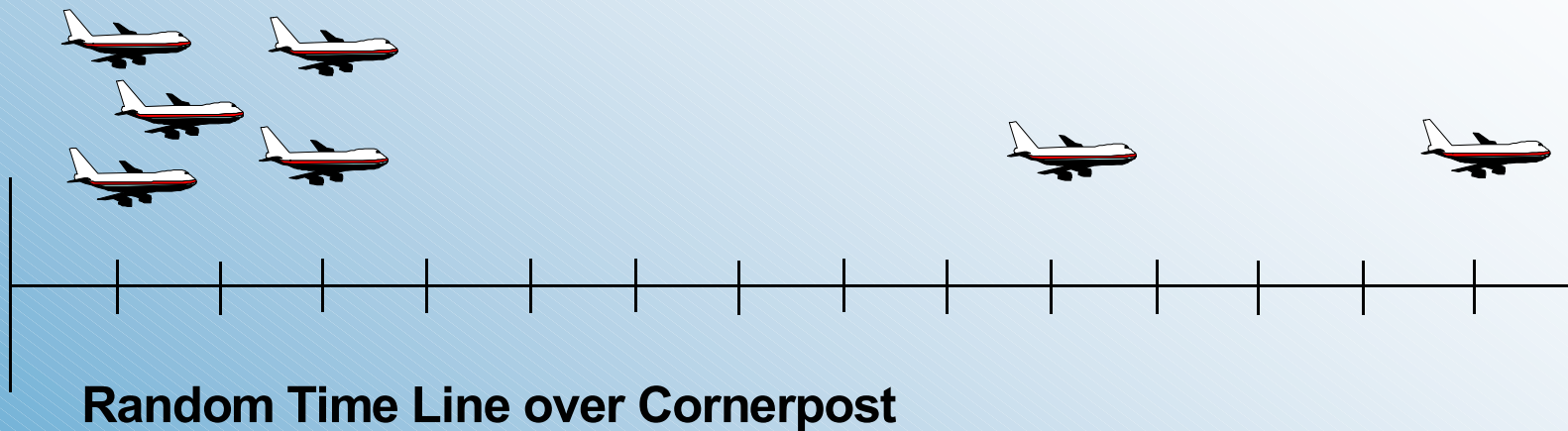


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* Patent Issued



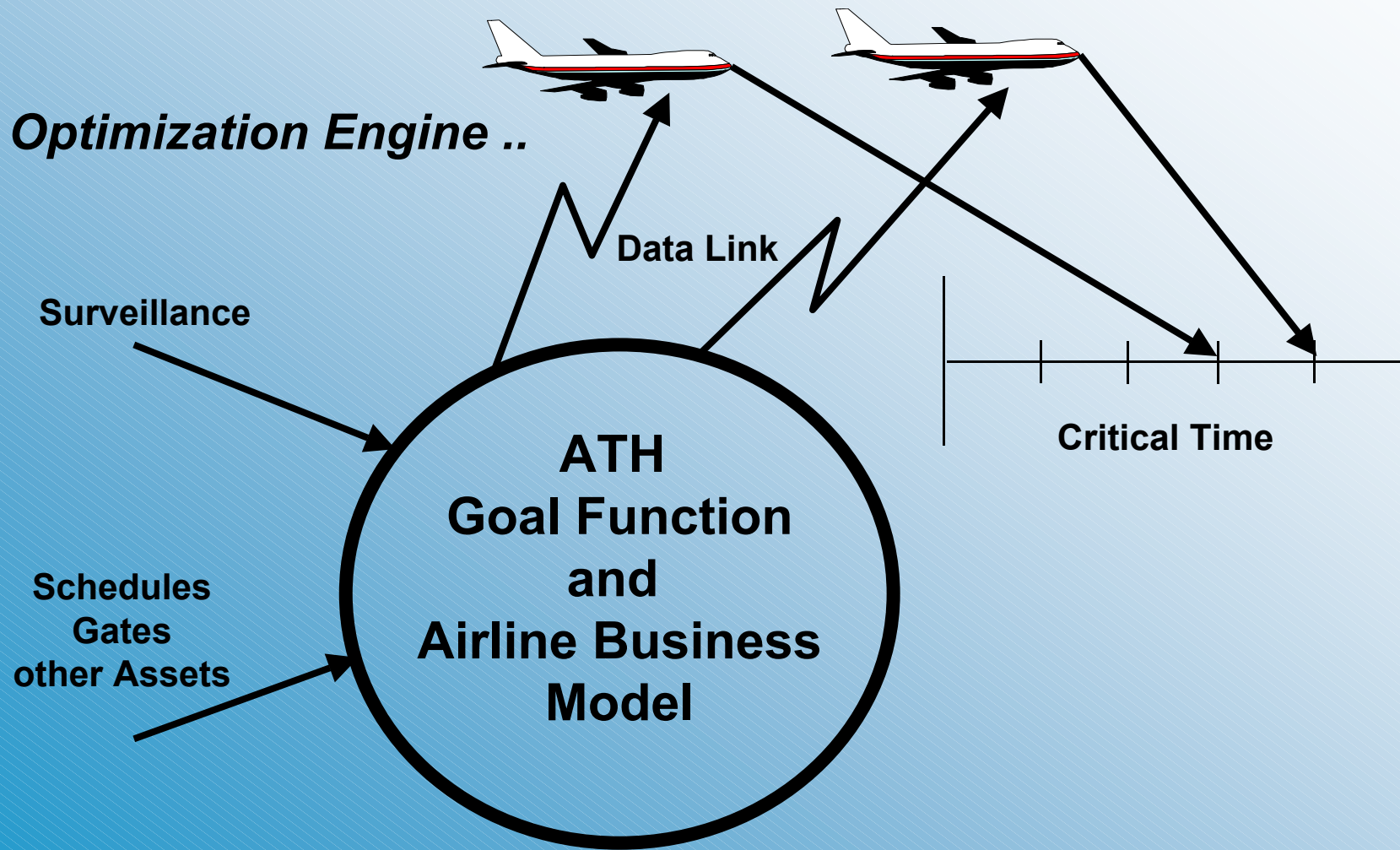
The *Attila*TM Process





The *Attila*TM Process Managing Complexity

.. Optimization Engine ..



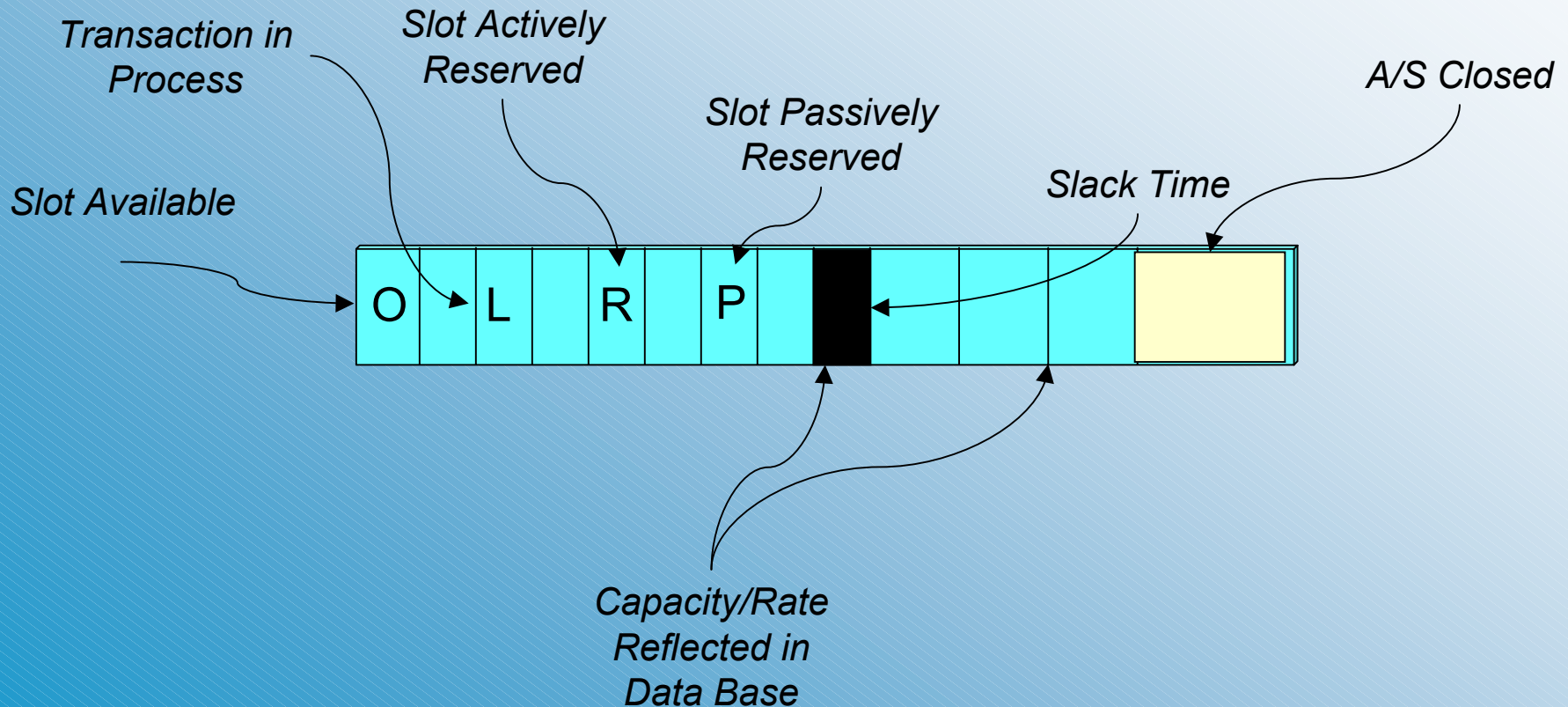
** Patent Issued*

Atomtm

Attilatm Exchange



.. for each critical fix point, such as an arrival
corner post ..

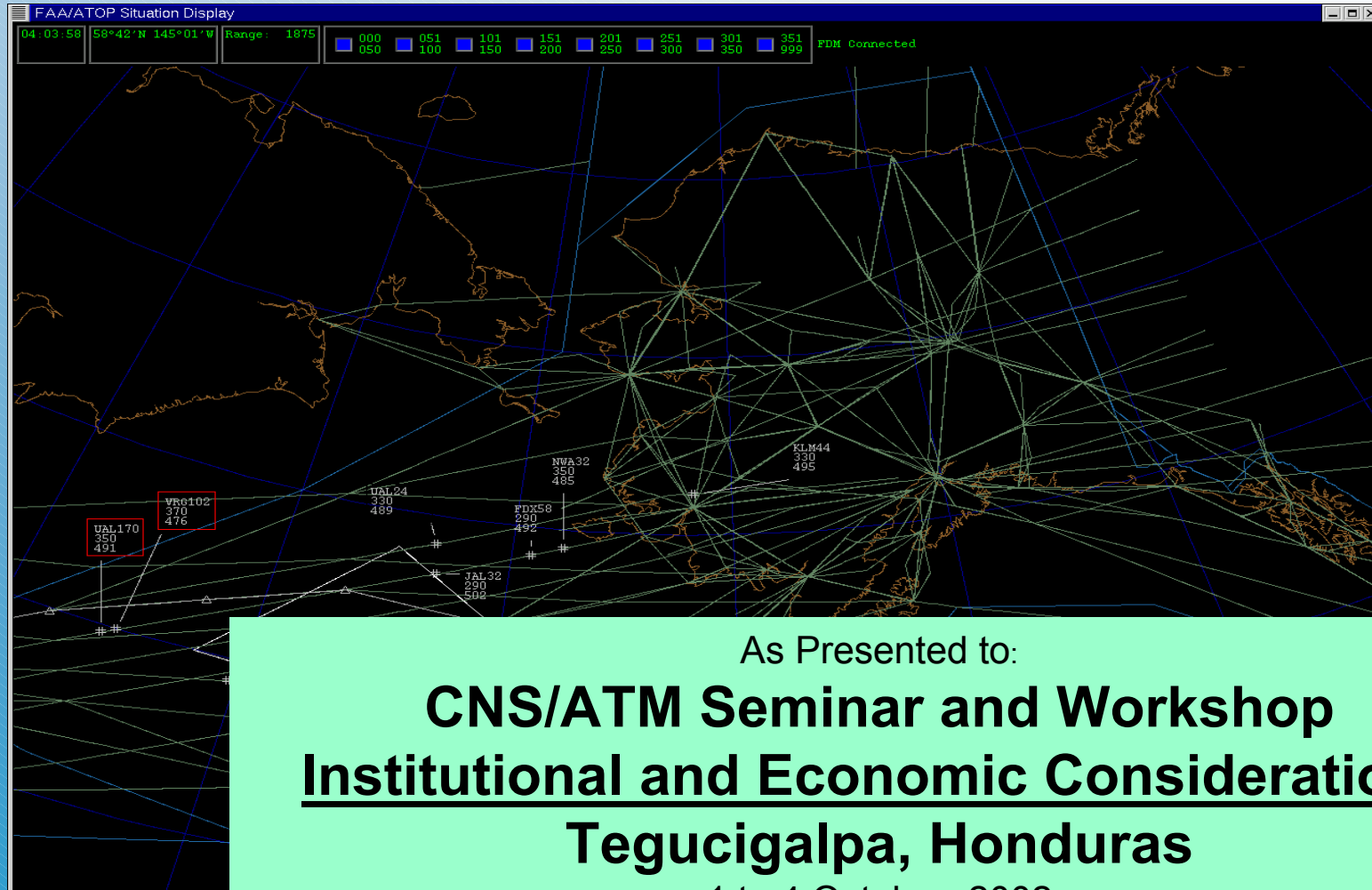


Atomtm

.. available slots will have one of four states ..

- **O** - Open, no reservation currently exists for this time slot,
- **P** - Passive reservation, **Attilatm** is predicting a valid aircraft will take this slot even though no reservation has been made,
- **L** - Locked, a transaction is in process on this time slot, and
- **R** - An active reservation exists for a valid aircraft for this slot.

Provision of ACC's Under Special Arrangements



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Briefing Outline

- Background
- Specification
- COTS Based Systems
- Future Proof
- Training
- Peace of Mind Warranty
- Revenue Based Financing



Background

“Air traffic management has reached a crossroads”

- **Many states require upgrade to their Air Traffic Management systems to support rising levels of traffic demand**
- **Often presented with a vast array of technologies which can be very costly and may not meet basic requirements**
- **Current revenue levels may not support upgrade to the latest technologies all at once**



Specification

..since no contract is required a detailed and costly specification becomes unnecessary ..

- In the time it takes to develop a detailed specification most systems become obsolete
- Often over-specified in some areas and under-specified in others
- Is often a critical document because it becomes part of a binding contract



COTS Based Systems

..use of commercial-off-the-shelf equipment insures the most modern system at the best possible price ..

- No need for costly specifications
- No special development costs
- Takes full advantage of technology advances
- Familiar components reduces training costs



Future Proof Support

..Your Atomtm system cannot become obsolete ..

- Guaranteed upgrades to software assure compliance with latest ICAO standards
- Guaranteed periodic upgrades of hardware to latest technology
- Additional functionality may be added at any time

Atomtm



Training

- Controller, Technician and Admin training provided with new systems
- Training provided with enhancements
- Train individuals or train-the-trainers for large facilities
- Window-based systems are familiar and intuitive



Revenue Based Financing

.. Atomtm is available on a percentage of revenue basis little or no up front costs ..

- You pay a small initial fee for installation
- Each month you pay a service fee for use based on your traffic level
- No contract is required. If the system performs well you keep it, if not return it and you owe nothing
- You may add additional functions at any time

Atomtm



Peace of Mind Warranty

***..Atomtm comes with our industry defining
“satisfaction guaranteed” warrantee..***

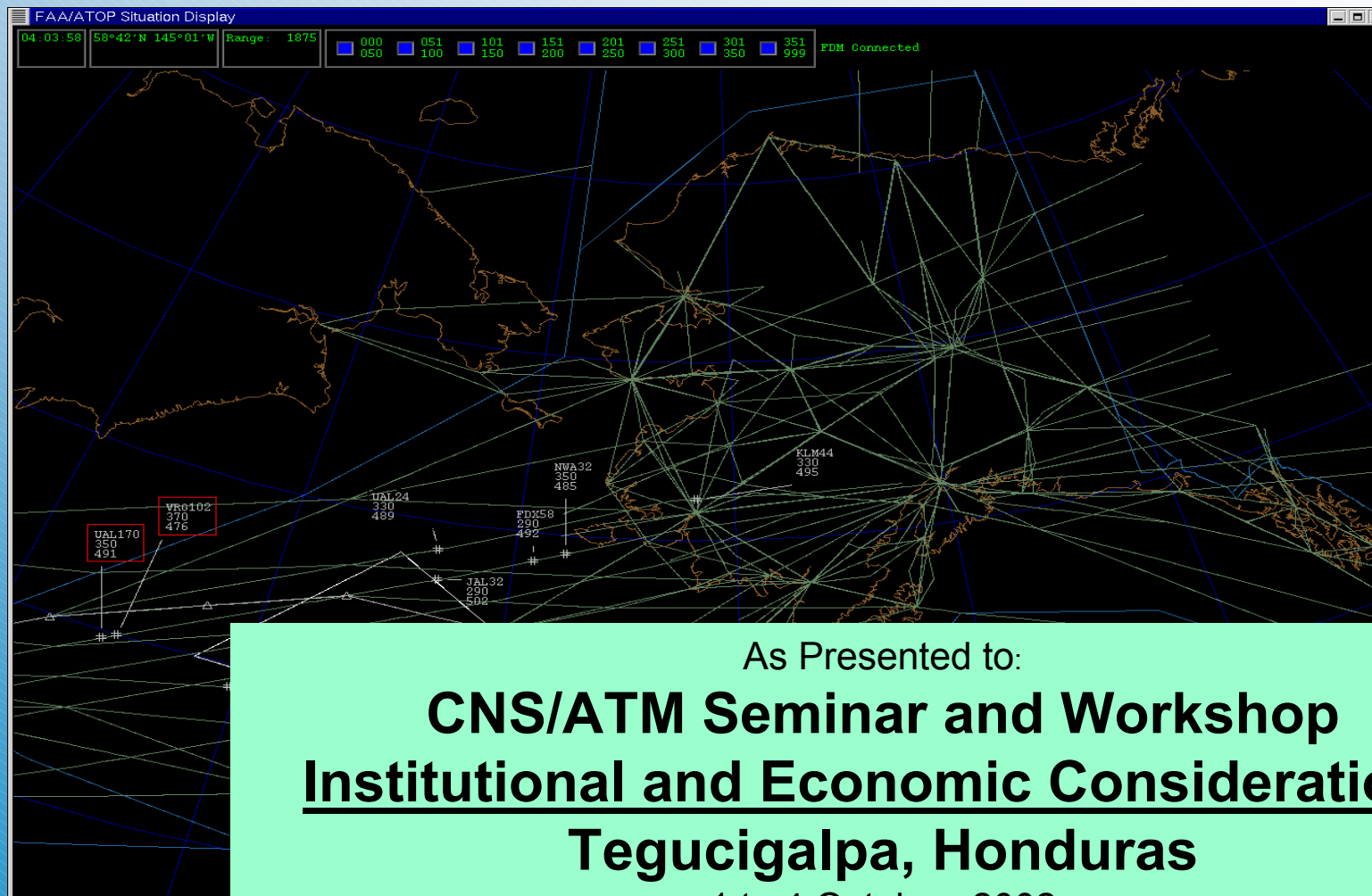
**If you are not happy you
don't pay**

It's as simple as that

Atomtm



ATM Transition Process



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Briefing Outline

.. the Atomtm approach allows you to go from a totally manual environment to a state of the art CNS/ATM environment with no capital investment ..

- Baseline System
- Integrated Surveillance
- Advanced Functions
- Flow Management

Atomtm



Baseline System

- Flight Data Processing
 - AFTN message processing
 - Flight strips
 - Center, Tower, AIS applications
 - ICAO message generation and sending
 - Position data entry
- User Billing



Integrate Surveillance

- Existing radars
- New radars
- Integrate with FDP for flight data
 - Use radar for automatic departures or estimates
- Beacon Code allocation
- ADS like techniques
 - ADS-B



Add Advanced Functions

- AIDC
- Conflict Prediction
- Arrival Departure Screens
- Customs/Immigration/Security Displays
- ICAO reporting
- Flight Service



Flow Management

- Passive Arrival Displays
 - Show sequence
- Active Flow Management
 - Control sequence with messages to A/C well in advance of arrival