

ÅAC Microtec
Spacemetric

Bluestone

Smart download of Earth observation data

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ÅAC Microtec and Spacemetric

- ÅAC Microtec

- Avionics for small satellites
- Established. 2005. Based in Uppsala, Sweden. Subsidiary at NASA Ames. 25 staff.
- Offer:
 - DHS & EPS subsystems and COTS components for to small satellites
 - Satellite buses: micro- and nano-satellites
 - Packaging and miniaturization of electronics for advanced applications such as interplanetary missions, large satellites, and critical performance

- Spacemetric

- Integrated image data management solutions for satellites, aircraft and UAS
 - Established 1999. HQ in Stockholm, Sweden. Subsidiaries in UK and the Netherlands. 16 staff.
 - Main product: Keystone image management system since 2005
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Bluestone Concept

Reduce data volumes from earth observation
by actively selecting data of interest

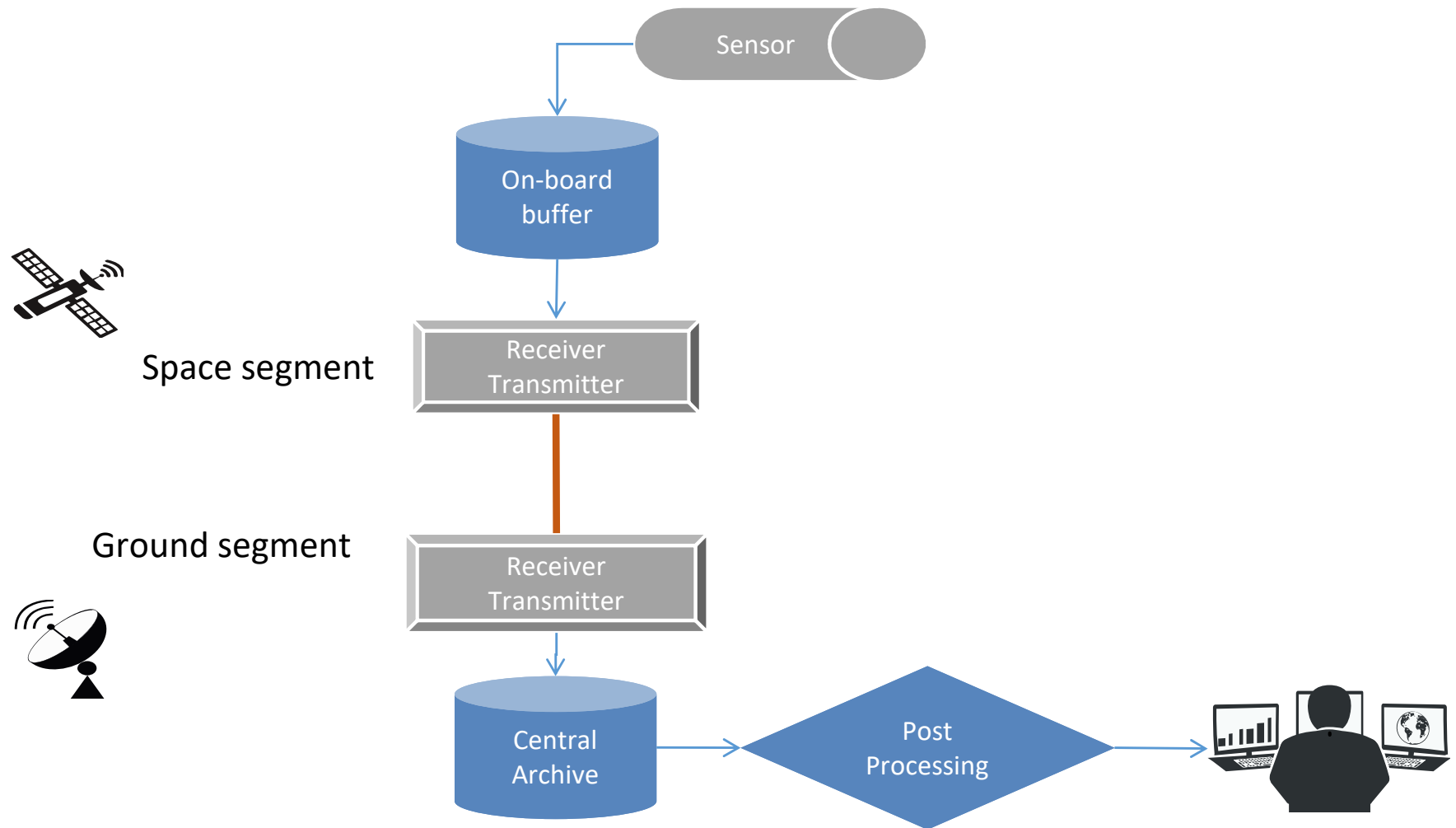
Background

- General
 - Volume of earth imaging data increases rapidly
 - Data downlink is a bottleneck
 - Small percentage of the data is actually used
 - Some data is more urgent for the end-user.
- Solution Approach
 - Bluestone optimises the use of the downlink bandwidth which is a bottleneck in the chain from payload to end-user.
 - Bluestone is a partnership product between Spacemetric and AAC Microtec.

More data generated – The same volume used



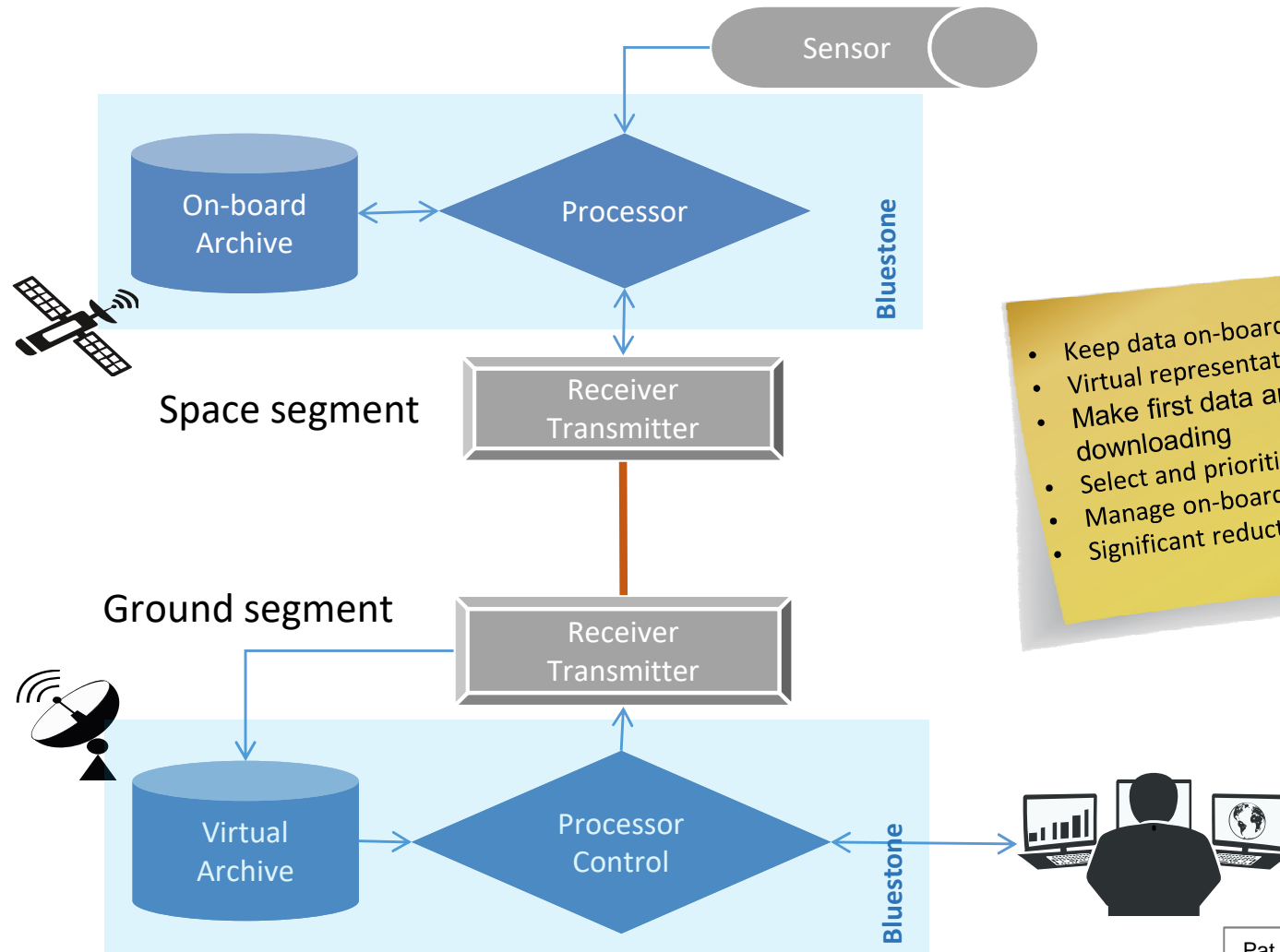
Conventional data distribution architecture



Central Archive



Bluestone – smart downloading of EO data



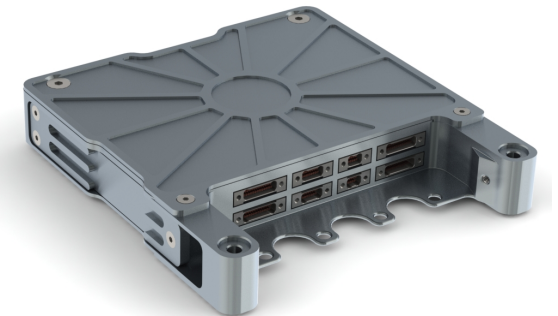
- Keep data on-board the satellite
- Virtual representation on the ground
- Make first data analysis without full downloading
- Select and prioritise pixels to be downloaded
- Manage on-board data
- Significant reduction of downlink bandwidth

Bluestone - smart downloading of EO data

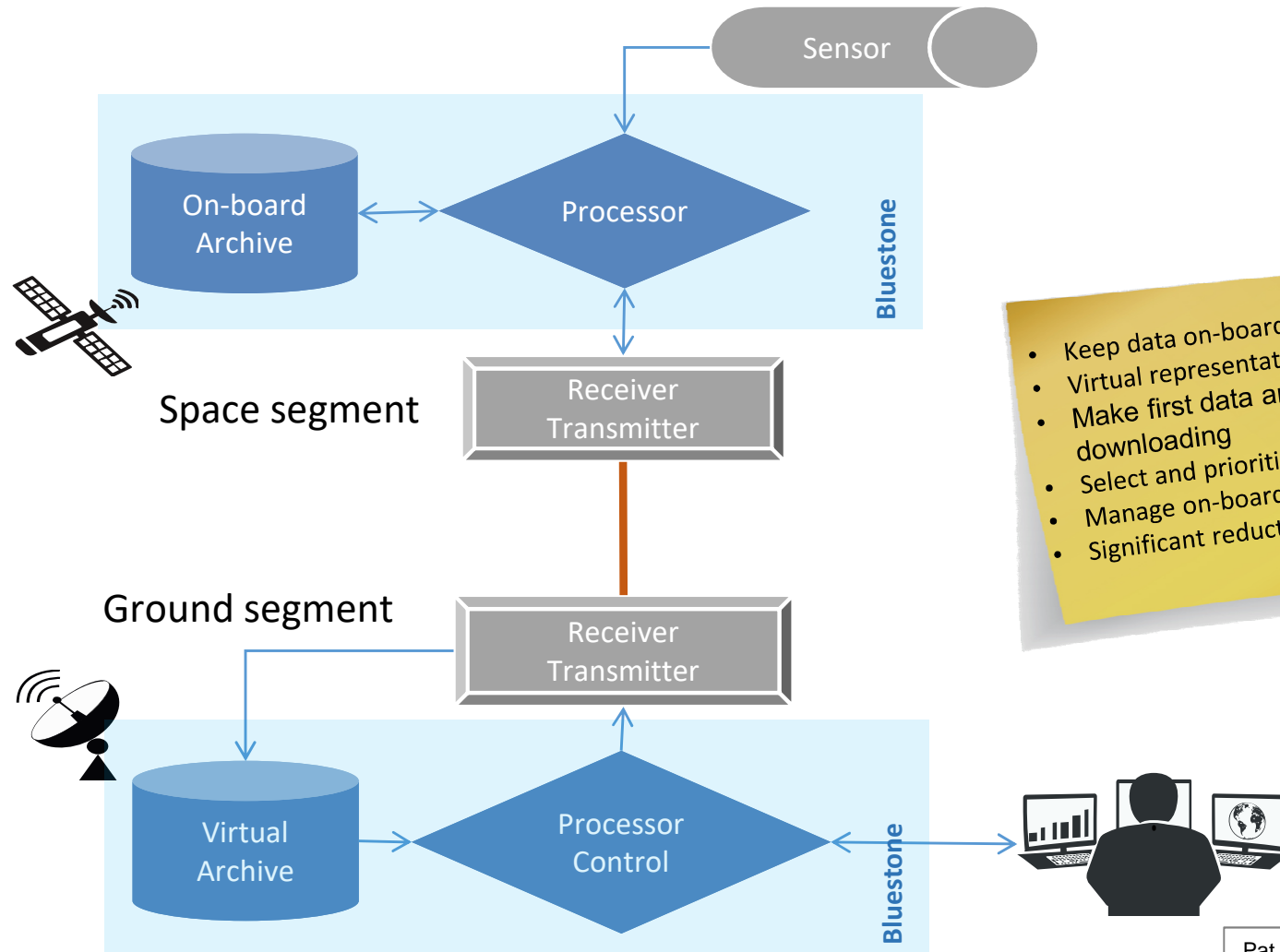
- Data is stored on-board the satellite.
- Bluestone downlinks previews and metadata during ground station passages
- The operator prioritizes urgent data or deselects low-value data from a virtual representation of the on-board data in his portal.
- Prioritized data is downloaded in real-time or at the next contact, depending on how quickly the analyses is done.
- Remaining data on-board is either deleted or slated for further analyses or for later downlink.

Bluestone System

- Ready made solution for Earth observation sensor data management
 - Self-contained Space segment hardware
 - Portable ground segment software package
- Space segment for data management and processing
 - partitioning and storing sensor data on-board
 - generating and downlinking overview data
 - retrieving data from archive in response to commands from ground
 - management on-board archive
- Ground segment software package for
 - receiving and viewing overview data (quicklooks)
 - generating commands for data retrieval and on-board archive management
 - storing data in ground archive



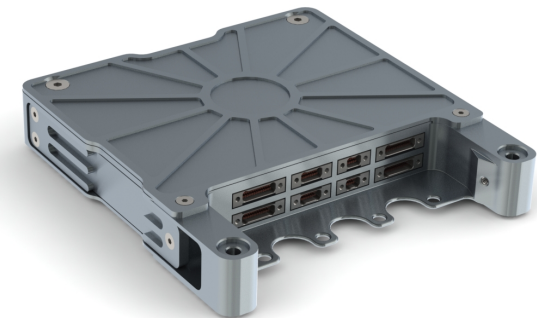
Bluestone – smart downloading of EO data



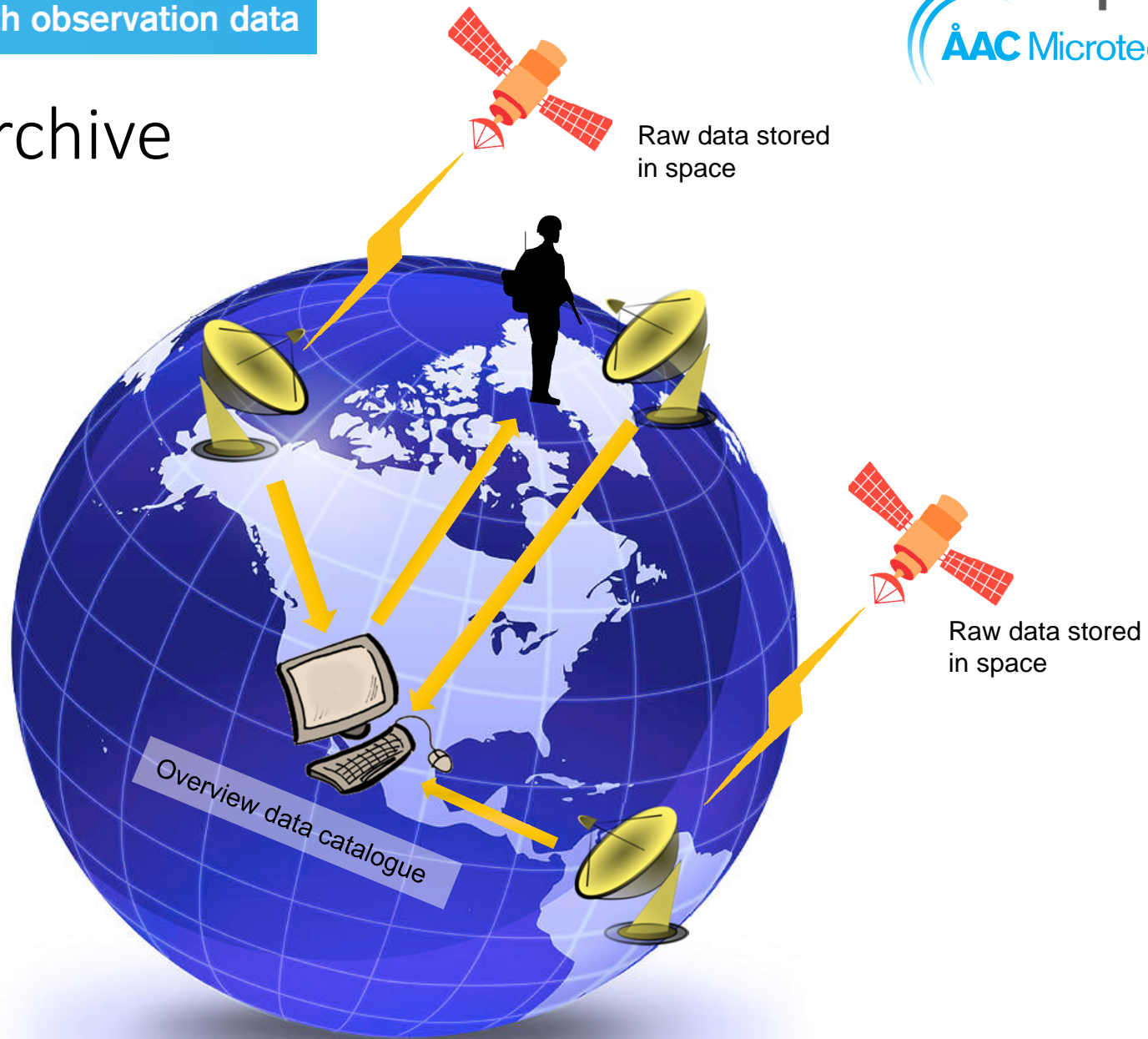
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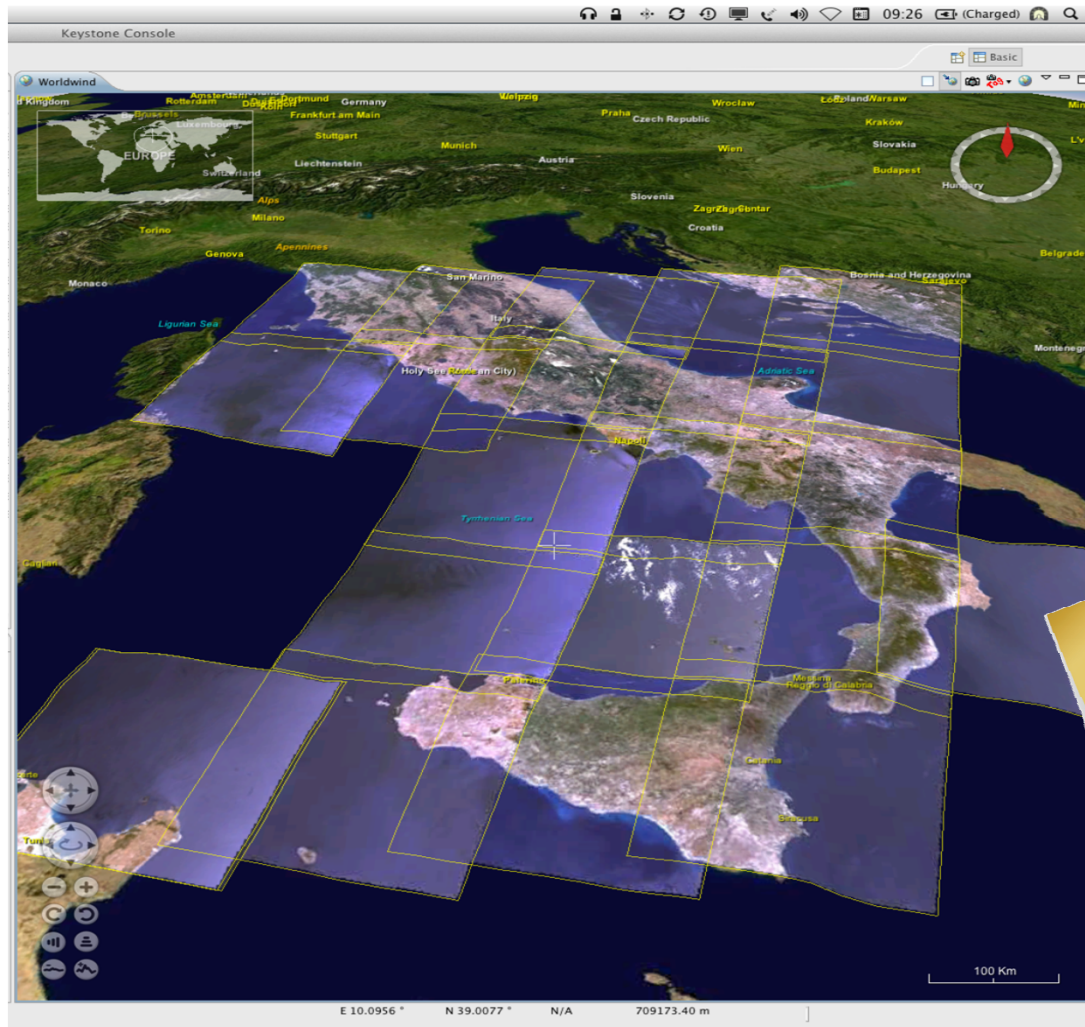
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Virtual Archive



Operator's virtual archive of on-board data



- The portal shows previews and metadata for all the data on-board the satellite

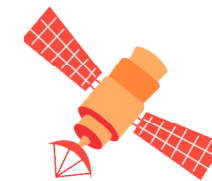
Applications

- Commercial Earth Observation
 - Cost reduction in on-board link system
 - Cost reduction in ground stations system
 - Cost reduction in downlink operations
- Astronomy, Space Physics and Space Exploration
 - Optimal use of narrow bandwidth downlinks
- Military
 - Optimal use of downlink to field ground stations
 - Low latency data access

Bluestone Expected Impact

- Enabling for Systems with Higher Data Rate Sensors
 - Wider swath
 - Higher spatial and spectral resolution
 - Video
 - Higher duty cycle
- Enabling High Resolution, Low Latency Field Applications
 - Light weight, low bandwidth ground stations
 - Direct-to-user data transfer
 - Reduced data transfer needs
 - On-orbit archives

Space Archive



Raw data stored
in space

Thank you for your attention!