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ESA Strategy and Architecture Studies for Lunar Exploration

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The European Space Agency is half-way through an industrial study to define a European Reference Architecture for Space Exploration. The study was initiated in July 2007 and will run until September 2008. There first part of the work, which was completed in December 2007, defined the architectural elements considered necessary to explore the Moon, based on a combination of scientific, economic and policy high level requirements. The derived lunar architecture, together with the associated strategy is the subject of this paper. During the remainder of the study, the architecture required to explore Mars, Near Earth Objects and Libration Points will be addressed, the aim being to derive an overall architecture that may be used to explore exploration targets in the Earth-Moon-Mars environment.

The overall architecture will be presented, with a particular focus on the key ESA capabilities, i.e.:
- Ariane 5 - based lunar lander, specifically addressing possible scientific reference payloads that could be delivered to the lunar surface by such a lander;
- Human transportation systems;
- Human surface support and habitation;
- Orbital infrastructures in cis-lunar space;
- Communciation/navigation systems.