Payload Data Ground Segment in Cloud for Earth Observation Satellites with the Entice Middleware

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 644179

Entice

Introduction

- EO evolved to provide several applications
- Monolithic systems with limitations
- Cloud computing solutions can be improved

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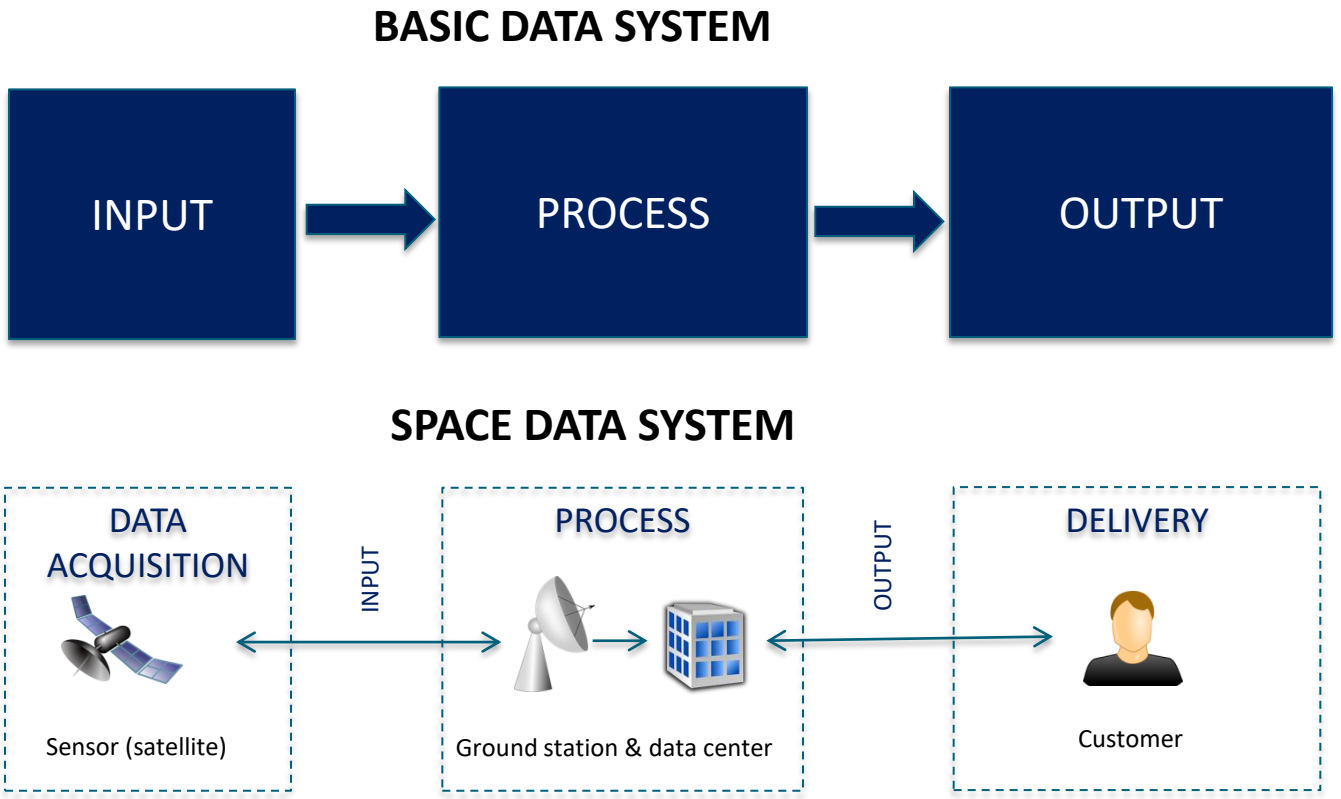
Introduction: Space Data System



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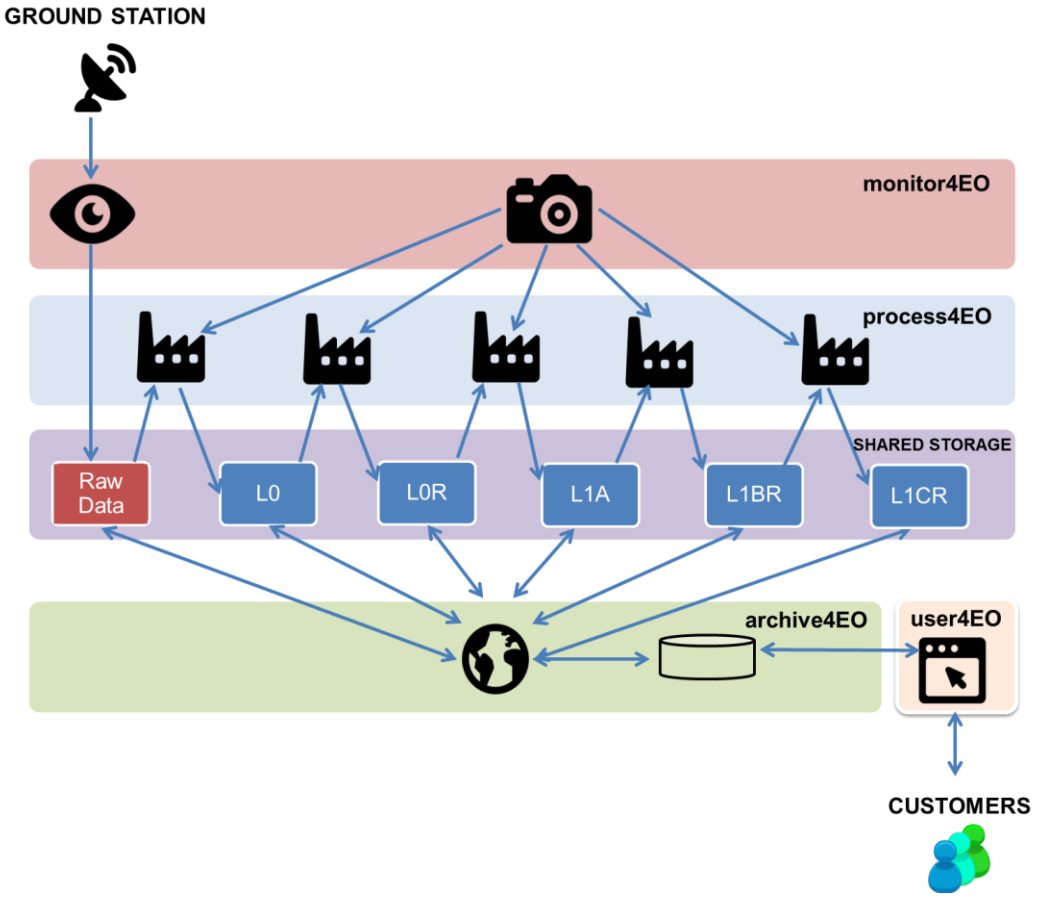
EOD Pilot: Architecture



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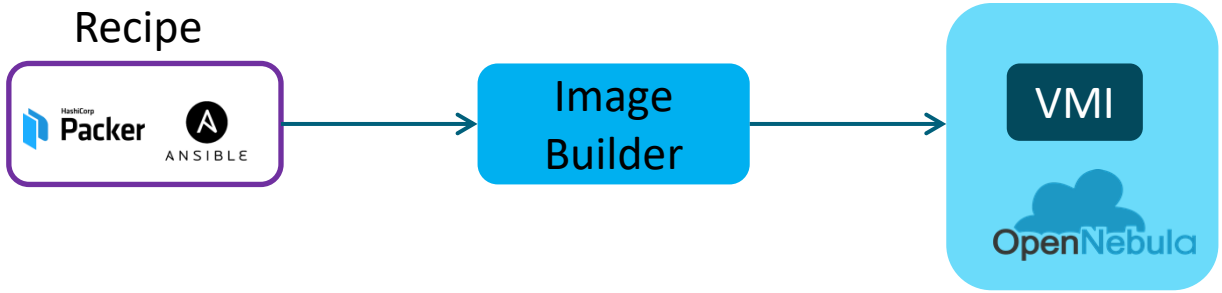
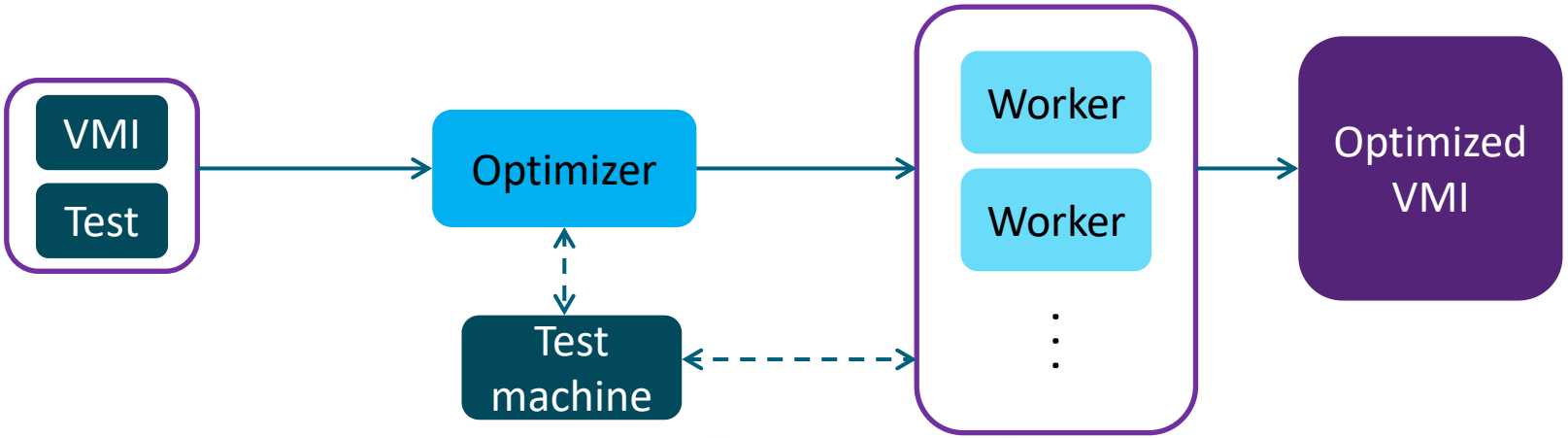
Entice middleware

- VMI creation automation (Recipe based image builder service)



- VMI optimization



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Objectives of the EOD pilot

- ☑ To successfully **implement the Deimos-2 PDGS in cloud**.
- ☑ To **automatize the deployment** of the EOD pilot.
- ☑ To **Optimize the EOD pilot** in performance and costs.

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Results: Creation time

	Process4EO	Monitor4EO	Archive4EO	User4EO
Manual	42.65	70.17	51.40	27.97
Automated	20.67	33.40	28.62	17.73
% Reduction	51.54	52.40	44.32	36.61

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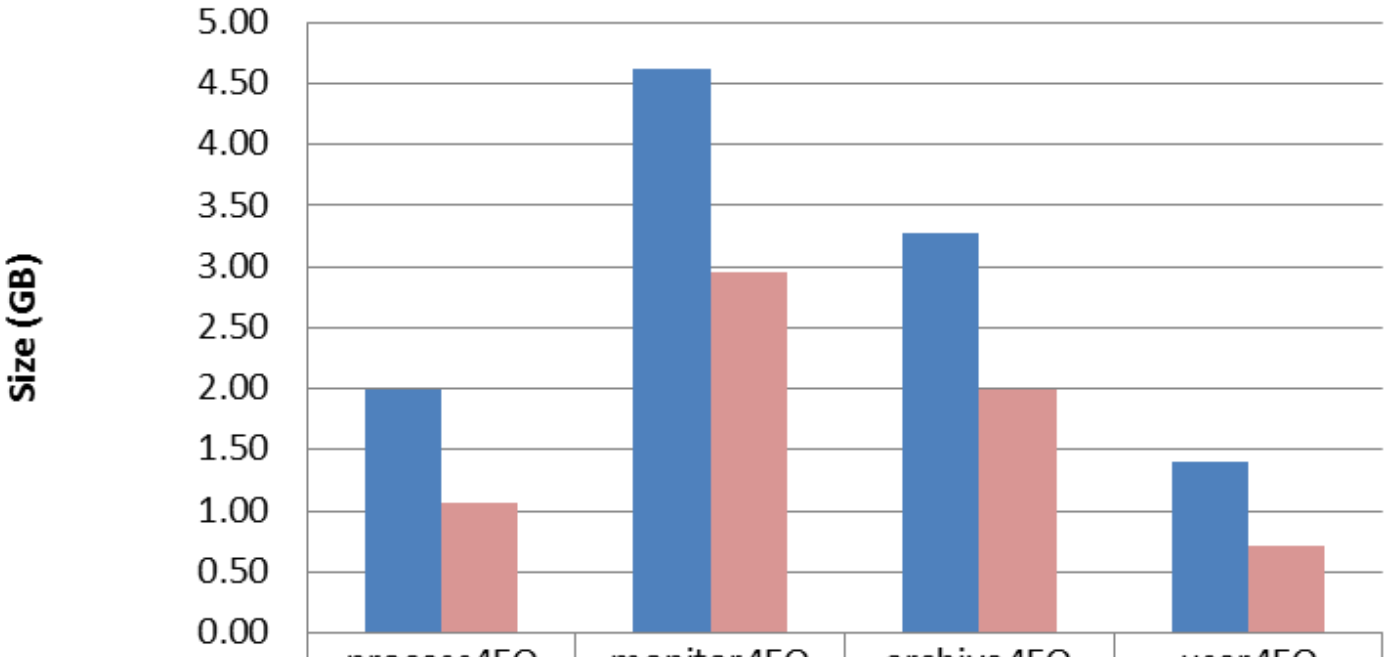
Results: Size reduction



	process4EO	monitor4EO	archive4EO	user4EO
Not optimized	1.99	4.62	3.27	1.40
Optimized	1.06	2.96	2.00	0.72

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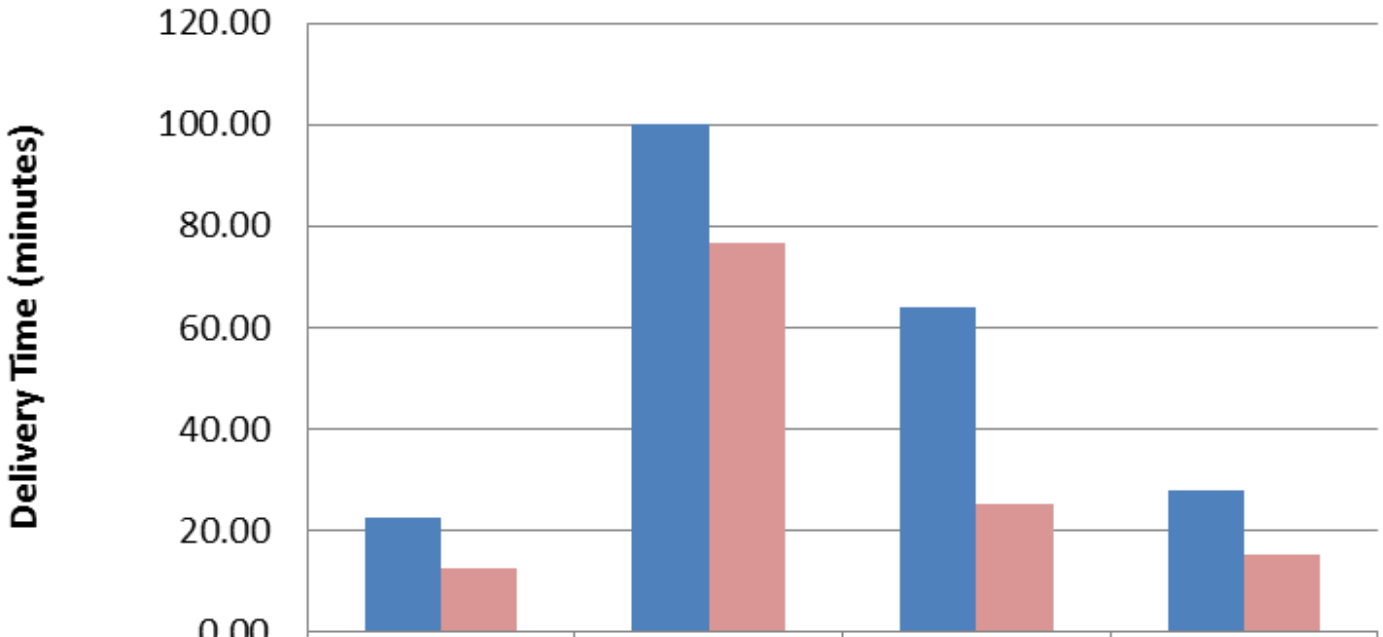
Results: Delivery time



	process4EO	monitor4EO	archive4EO	user4EO
Not optimized	22.65	100.00	64.00	27.98
Optimized	12.37	76.73	25.22	15.12

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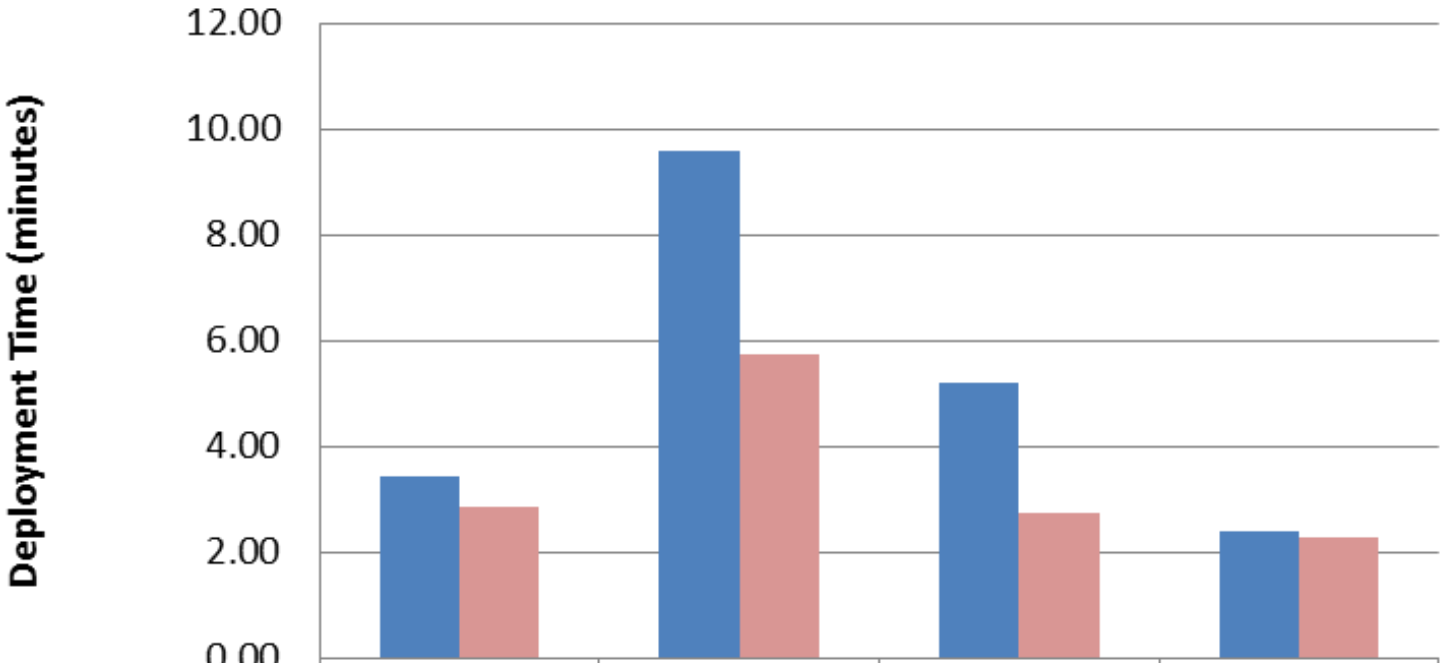
Results: Deployment time



	process4EO	monitor4EO	archive4EO	user4EO
Not optimized	3.45	9.57	5.22	2.42
Optimized	2.87	5.75	2.75	2.30

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Results: Summary

Percentage of improvement in the metrics:

	Process4EO	Monitor4EO	Archive4EO	User4EO
Size	42.73	35.93	38.87	48.57
Delivery	45.39	23.27	60.59	45.96
Deployment	16.81	39.92	47.32	4.96

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Conclusions

Expected results vs real results of deploying the EOD pilot in ENTICE environment:

Metrics	Expected	Reduction
VMI Size	Up to 60%	Between 35.93% and 48.75%
VMI Creation Time	Up to 25%	Between 36.61% and 52.40%
VMI Delivery Time	Up to 30%	Between 23.27% and 60.59%
VMI Deployment Time	Up to 20%	Between 4.96% and 47.32%

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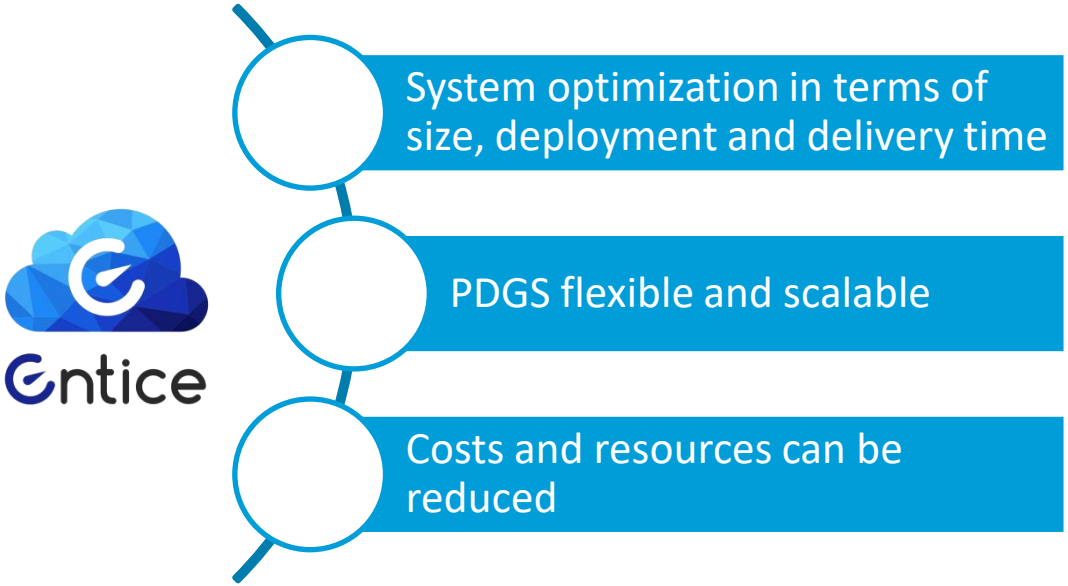
Conclusions



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Thank you

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