Open Grid Forum
OPEN FORUM | OPEN STANDARDS

February 2007

GridConnections

News and Information for the Open Grid Forum Community

INSIDE THIS ISSUE:

OGF ACCELERATES GRID ADOPTION BY PROVIDING AN OPEN FORUM AND DEVELOPING OPEN STANDARDS

Perspectives and Directions

by Mark Linesch, President, OGF

"Pragmatism" is sometimes described as an approach where value is determined by practical results. A "pragmatist" is said to be someone who takes a practical approach to problems, accepts the world as it literally is, and deals with it accordingly.

During 2007, pragmatism will take center stage for many in our community as successful grid implementations become more common-place and interoperability becomes less theoretical and more operational. Interest in interoperability between grids will continue to grow and questions regarding how grids align and integrate with existing IT data center architectures and concepts such as virtualization will need to be answered. Increasingly our community will be asked to provide practical solutions and results to these and other issues based on the experience we have gained over the last few years.

As our name implies, the Open Grid Forum is focused on providing an *open forum* for grid innovation and developing *open standards* for grid software interoperability. In our first seven months as OGF, we achieved several significant accomplishments as Steve Crumb outlines in his article later in this newsletter. Of special note was the OGSA HPC Profile SC06 Interoperability Demonstration. We are reprinting the Q&A with Marty Humphrey on the demonstration in this newsletter. During 2007, OGF will be working hard to provide a more productive environment for grid innovation, outreach and communication – focusing on the requirements of our key stakeholders while redoubling our efforts to deliver specifications that enable grid software interoperability.

The OGF Technical Strategy and Roadmap (TS&R) will provide a mechanism for this ongoing pragmatic dialogue regarding directions and priorities with our key stakeholders. The initial draft of the TS&R will be published for public comment in January 2007 in preparation for what we hope will be a lively set of

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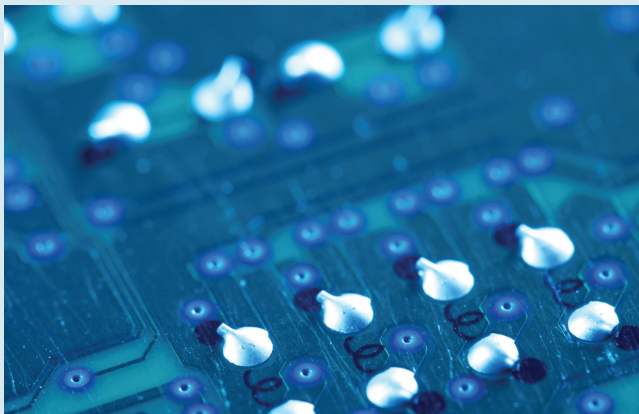
"During 2007, pragmatism will take center stage for many in our community..."



Perspectives and Directions

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discussions during OGF19 being held in Chapel Hill, NC, USA, January 29 – February 2. The Technical Strategy Committee (TSC) has been hard at work soliciting input and documenting our directions. The "requirement summits" that we began during GGF18 will continue throughout each of our 2007 events. These summits provide opportunities for members of our community to communicate requirements, shape priorities, and engage in our technical strategy and roadmap process.

One of the key stakeholder groups within OGF is the organizations that have already deployed major grid infrastructures around the world such as EGEE, TeraGrid, the Naregi project and others. OGF's GIN (Grid Interoperation Now) community group is bringing these stakeholders together to work on a very pragmatic approach to interoperability. The purpose of the GIN group is to organize and manage a set of interoperation efforts among production Grid projects. This project has a short term goal of planning and implementing interoperation in specific areas such as job description and execution, data location and movement, authentication and authorization, etc. It is also proving to be a very valuable "sounding board" for dialoging about requirements and priorities with our Standards Working Groups and newly established Technical Strategy Committee.

Another critical stakeholder group within the grid community are the software developers and providers who utilize our specifications in the products and tooling they develop to enable successful grid deployment. During 2007 we will be experimenting with providing a "Software Providers Forum" at OGF events to enable our community to interact more regularly and substantially with the key open source and commercial software providers. Software providers are critical partners of OGF and our community and we hope to make these forums an ongoing and productive fixture of OGF events throughout 2007.

The OGSA HPC Profile is a recent successful illustration of a group working closely with key stakeholders to understand requirements and deliver timely results – providing an example that I hope other groups can leverage in the future. The OGSA HPC Profile began as a set of observations from several leaders within the OGF community. Their perspective was that successful standardization efforts often address small, well-defined and modular subject areas while taking into account broader and sometimes longer term goals. By starting with simpler designs that can be enhanced over time, fast progress can be made and capabilities can then evolve in an incremental fashion. Aligning early and often with key stakeholders and keeping it simple allows OGF to deliver simple, yet effective specifications that the grid community has determined to be of high value faster with a collaborative spirit and focus on results.

As always, I want to thank our many group members for their enthusiasm, active participation and hard work. I also want to challenge all of us within the grid community to become more pragmatic in our approach to grid innovation and standards during 2007 so that we can communicate and deliver the practical results our stakeholders require.

"These summits provide opportunities for members... to communicate requirements, shape priorities, and engage in our technical strategy and roadmap process ..."

Fujitsu Siemens Computers: Putting Business on the Grid

Fujitsu Siemens Computers is the leading European IT provider with a strategic focus on next generation Mobility and Dynamic Data Center products, services and solutions. With a platform and services portfolio of exceptional depth, the offering extends from handhelds through desktops to enterprise-class IT infrastructure solutions and services offerings.

"The Dynamic Data Center (DDC) is a focus of Fujitsu Siemens Computers in our Enterprise IT offering. We clearly see the paradigm shift towards Grid infrastructure for transactional Enterprise applications and we are convinced that Grid standards will significantly accelerate the adoption of this groundbreaking concept. This is why we are excited to engage with OGF and to actively contribute to fulfilling the OGF mission." – *Bernd Kosch, Vice President Alliances* Rapidly changing business models and financial considerations have a direct impact on corporate IT organizations. IT investment decisions have traditionally been driven by a quest for greater reliability and efficiency; today, however, a third issue – agility – has become equally important. IT decision-makers have gradually become aware of the need to adopt a new approach. Rigid systems based on the use of dedicated resources are fast becoming a thing of the past. The current trend is toward flexible solutions that can accommodate changes in IT requirements without any major effort and for the most part automatically. This approach calls for a new generation in IT architecture. That's what the Dynamic Data Center™ from Fujitsu Siemens Computers is all about.

FlexFrame™ for Oracle is an important module of the Dynamic Data Center™. Enterprises can now deploy a grid computing infrastructure solution that supports not only standard applications, but also self developed applications. In fact, a review of various customer scenarios shows that FlexFrame™ for Oracle can result in significant improvement in overall IT operation even in enterprises that run only a single application. These scenarios underscore that the potential for enhancement that users can tap into with FlexFrame™ for Oracle increases with the complexity of the existing environment.

Platform Computing

Platform Computing was started by Songnian Zhou, Jingwen Wang, and Bing Wu, three young people with a vision, a spirit for innovation and entrepreneurship, and an abundance of passion. In the last 14 years, through its technological excellence, its vision, its dedicated and talented employees, and commitment to customer success, Platform has emerged as a pioneer and leader in distributed computing.

In 1987, Songnian completed his PhD at Berkeley. While working on his doctorate, he had mobilized multiple computers on an axis, and realized that when the computers were connected, the load was very uneven. This is how Songnian came to realize the need to share resources and his vision of distributed computing was born. Beyond this distributed computing technology concept, he saw the need for software to manage these compute farms and data centers, to ensure that extremely heavy and complex computing loads were shared between computing resources in the most efficient way, enabling improved productivity, faster time-to-market for products, and competitive advantage.

Upon completing his studies at Berkeley, Songnian moved to Toronto to teach as a Professor at the University of Toronto (U of T). It was at U of T that Songnian and his team of researchers first developed "Utopia", the LSF prototype. In May 1992, Songnian received his tenure at U of T, and a couple of months later, started Platform Computing along with Bing Wu and Jingwen Wang.

Grid computing can help organizations gain competitive advantage by improving collaboration, creating higher quality products and services, and optimizing IT investments. Platform sees a tremendous opportunity for the OGF to lead the community towards interoperability and standards and by extension increase the adoption of grid technology.

Network Appliance: Enterprise HPC Storage at its Best

With the explosive growth of data, especially in high performance computing applications, managing information and data storage has become ever more challenging. In 2003, Network Appliance acquired Spinnaker Technology, a startup with compelling scalable storage clustering technology, and merged its global namespace and data migration technology with NetApp®'s DATA ONTAP® file system and protection capabilities.

The result is the highest performing, most reliable and scalable storage architecture available to grid community – Data ONTAP GX. With its extensible global namespace and location transparency, users never need to worry about where their data resides, all information is available to all users and applications, greatly simplifying administration and management. It supports open systems standards such as NFS for Linux®/Unix® and CIFS for Windows® environments.

Enterprise class data protection features incorporated at all levels within the architecture increase failure tolerance and ensure mission critical reliability. Theses include dual disk failure protection, node failure resiliency, on-disk consistency, fast global snapshots, replication/mirroring and NDMP.

In situations where changing business priorities demand additional performance, throughput or storage capacity, GX provides the ability to tune loads, migrate capacity, add nodes and/or storage in the background without disruption.

Recently, a 24 node Data ONTAP GX system shattered the Spec SFS benchmark with a record 1.03 million ops/sec (overall response time of <1.6msec); which is 3 x the performance of any other Spec SFS posting. It can also deliver throughput numbers exceeding 10GBytes/second.

While these benchmark results are impressive, the real value and impact of Data ONTAP GX comes to bear with its simplicity, reliability, availability and manageability. With Data ONTAP GX, storage can now keep pace with large compute grids and demanding HPC workloads. NetApp is excited to be a sponsor and OGF board member helping to deliver solutions that benefit enterprises and the HPC community.

OGF HPC Profile Interoperability Demonstration

Q&A with Marty Humphrey, HPC Profile WG Co-Chair

GC: Tell us a little about what the HPC Profile team accomplished at SC06

MH: The HPC Profile WG is an effort in OGF to create the profile and protocol specifications needed to realize the vertical use case of batch job scheduling of scientific/technical applications. Our WG's approach includes leverage two existing OGF WGs – the OGSA Basic Execution Service (BES) WG and the Job Submission Description Language (JSDL) WG. Basically, our HPC Profile WG is contributing requirements and approaches to the BES WG and JSDL WG to ensure that their respective specifications could be used in our particular use-case of batch-job scheduling.

By this past September (OGF 18 in Washington, DC), our WG had gotten to the point that we felt pretty good about the state of the specifications (the BES spec, the JSDL spec, and our document describing how to basically combine the two specifically for batch-job scheduling), so we decided that it would be great to have a big "interoperability-fest" at SC2006 – essentially having people aim their HPC Profile-compliant clients at other projects' HPC Profile-compliant services. We thought that this would be great fun and very satisfying! Most importantly, we believed that you get to a point in writing specifications where you think they're correct, but it takes a number of different, independent implementations attempting to talk to each other to identify and resolve some of the really tricky issues. We believed that we were at that point, so we really needed to attempt this "interop-fest" to improve the specifications. SC 2006 was a great forcing function for this!

We ended up having 12 groups participating: Altair Engineering, Argonne National Lab (Globus Alliance), CROWN, EGEE, Fujitsu Labs of Europe, HP, Microsoft, Platform Computing, Tokyo Institute of Technology, UK eScience (OMII-UK), University of Virginia, and Genesis II (UVA). Most groups showed independent demos, some focusing on server-side functionality, and some focusing on client-side functionality. Rich Ciapala of Microsoft came up with a great demo, where he submitted a job to one of the other participant's servers. Once on that machine, the "job" was actually an HPC Profile-compliant client, which "forwarded" the job to another HPC Profile-compliant resource, which forwarded the job to another HPC Profile resource, for a total of maybe 6 hops. I thought this idea was outstanding – it showed how the HPC Profile could be used to facilitate "super scheduling", where a resource might get a job submitted to it, but then the resource off-loads it to someone else, either because it is too busy or it might not have the requested application currently installed, or whatever. In this case, because all resources "spoke" the HPC Profile, the client could communicate with any of the back-end resources that the job ultimately executed on. The really neat thing about this demo was that there was probably an equal mix of Linux-based systems and Microsoft Compute Cluster Server (CCS) systems. That's what it's all about – interoperability and support for heterogeneity!

I know that a number of the groups showed this demo from their booths, and I heard a lot of good comments about it. A number of people were surprised that we could do this, and saw how this capability could pay off for them in the future.

GC: That seems like a major milestone for OGF

MH: Oh, I certainly think so! We created the HPC Profile WG with some pretty tight deadlines – that is, many people in the group are from companies (as opposed to academia/labs), so they wanted to get this working and somewhat stable as fast as we could. These people have products to ship, and their customers want interoperability. So they were very driven. This interoperability demo at SC2006 really showed how people could come together in OGF, with tight deadlines, and produce a set of specifications and a relatively large number of interoperable, independent implementations. This really said something about our OGF community!

GC: What are the top 3 things the team learned?

MH: If I were forced to choose three from my perspective as HPC Profile WG co-chair, I think I would say: [1] An "evolutionary approach" is really good – focus on existing tooling or tooling that's arriving-very-soon. The ability to have common protocols or interfaces for batch scheduling is needed NOW, and continually waiting or anticipating next year's tooling or protocols is not appropriate for this particular effort. Rather, create a design

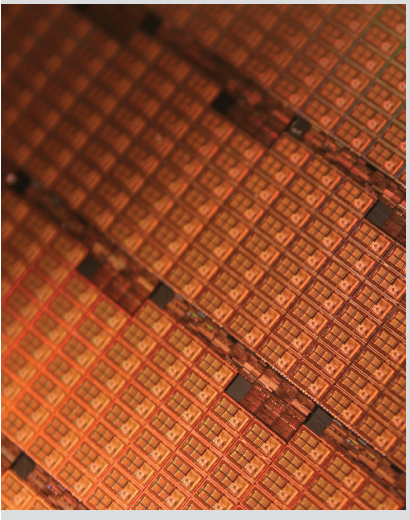
today and can be updated without great upheaval in the future. Anticipate next year in today's design, but don't overly rely upon it coming, because it might never come. By doing this, we were able to create as many interoperable implementations as we did in time for SC 2006!

[2] Don't make the effort too broad – I think we were successful because we scoped-down the problem to a much more manageable level, specifically the execution of scientific/technical apps on batch job schedulers. If this were broader, I believe we would still be attempting to create the SINGLE protocol that accommodated EVERYTHING, and that just hasn't worked out in the past. There are too many moving parts, and the "fringe" parts tend to make the "core" parts too difficult to implement.

[3] Build broad community involvement from the very beginning – the HPC Profile WG has many people involved in it, and from the start a lot of people have contributed to its formation. Getting people involved and making them stakeholders with something to gain if the WG is a success (and something to lose if the WG fails) is crucial.

GC: How was the demo received by the HPC audience?

"This interoperability demo at SC2006 really showed how people could come together in OGF, with tight deadlines, and produce a set of specifications..."



MH: Collectively we spoke to a large number of people at SC 2006. In talking afterwards with some of the participants in the demo, I think people who saw the demo generally fell into one of three categories:

[1] "Interesting! I could see how this would help!" – The capabilities that the WG collectively demo'd were very compelling to those people who have not seen something like it.

[2] "It's about time!" – Some people we spoke to thought that at least on the surface, the ability to have a single interface/protocol to the multiple batch job scheduling systems absolutely made sense and did not seem too difficult, so they said they were surprised that it took THIS long for the community to do this. I think we generally replied that it's only now that Web services protocols and tooling are converging such that this type of thing is possible. We can't really speak to the efforts of others in the past, but we CAN try to step up and make a difference today. That's what we're doing.

[3] "A good start – but I need more!" We explained that there's some misconception here in the HPC audience. The HPC Profile WG (in particular, the HPC Profile WG use-cases document) identifies a "basic profile" and extensions. The "HPC Basic Profile" is the core functionality that we expect will be implemented by ALL batch scheduling systems. The "extensions" by definition are common functionalities that we expect will be implemented by two or more (even perhaps a large majority), but not by everyone. A perfect example of an "Extension" is file staging, for example when you want to move a file to the batch scheduling system before execution, so that the executable can use the file as input. We believe that this is a really important requirement addressed by most batch scheduling systems. But is a single standardized way to do this for ALL batch scheduler systems needed? No, we don't believe so. In fact, the HPC Profile interoperability demo at SC2006 showed this! We were able to do a lot of interesting things without a standardized way to stage files in and out. Input/Output file staging was still required for most of the demos, but there wasn't a single way to do it (some used FTP, some used HTTP, some used their own particular way). So we don't think this should be in the HPC Basic Profile. It will absolutely be one of the first "extensions" – and services will have the ability to assert that they implement the "data staging extension" as well as the Basic Profile. So when people said that they "needed more", we absolutely agreed! But this demo was just the HPC Basic Profile, not any/all of the extensions as well (which are clearly part of the plan). When we explained this to people, I think generally they understand and respected/appreciated this approach.

GC: What are your plans to do as a result of the interop?

MH: Well, we've already started the teleconferences to address important issues that were raised during the implementation and interop-fest itself. These issues include: clarifying the semantics of certain operations, clarifying some XML schema to make it more amenable to certain tooling, and specifying security in the Base Profile. We're hoping to get the Base Profile into public comment either this month (which may be optimistic) or January. And we're

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Seven Months of Progress

Only seven months ago, the leadership of the Global Grid Forum (GGF) and the Enterprise Grid Alliance (EGA) came to agreement to launch a new organization to accelerate the adoption of grids in research and enterprise. Has the Open Grid Forum (OGF) lived up to its expectations in the first few months? As you think about your answer, please consider a few of the "highlights" of the past half year.

First up, we completed the merger and formally launched our new organization at GGF18 last September. Leadership teams from both GGF and EGA contributed a great deal to the development and launch of the new organization, working to complete – on time – all of three phases of the merger process. All in all, it felt very good to both celebrate our past successes and look ahead to our future opportunities as a new organization.

The real story, in my opinion, was not the organizational launch, but the seemingly undistracted progress made by many chartered groups during the uncertain period of transition. These groups didn't "wait to see how it would come out" but stayed engaged resulting in over 25 documents being published including three proposed recommendations from our Data Area. Just within the last 4 months, we have published 14 new documents all of which are listed on page 7 under the *New Published Documents* banner.

And at SC06 we held a very successful interoperability demonstration of our OGSA™ HPC Profile which enables interoperability between various resource managers based on a combination of web services standards and OGF specifications including Job Submission and Description Language (JSDL) and OGSA Basic Execution Services (OGSA-BES). In short, I'm amazed at how the community stayed focused and delivered in the midst of an uncertain period and heartily congratulate all those who kept their eyes on the prize.

During the past several months, a number of new projects have been launched and are gaining momentum. The Grid Interoperability Now (GIN-WG) was launched to organize and manage a set of interoperation efforts among production grid projects by focusing on a small list of essential services needed for interoperation across these production grids. Another project that has begun to take shape within OGF is our Technical Strategy and Roadmap project (TS&R). A key change resulting from the merger was to create a Technical Strategy Committee (TSC) within OGF and document our directions through the publishing of a Technical Strategy and Roadmap. The first version of our TS&R document will be published in January 2007.

Finally, we have put much effort into planning our next two events, OGF19 and OGF20. OGF19 will be a great opportunity to get some "heads down" work done in Standards, eScience, and Enterprise. OGF20, being held in Manchester, UK, on May 7-11, 2007, will include an extensive enterprise grid track and offer a unique opportunity to engage with EGEE users, UK eScience participants, and other European Commission funded grid projects.

From my point of view, this organization has built a strong foundation upon which past and future work has and will continue to be built. In the midst of uncertain times, the OGF has increased its productivity and continues to engage in important activities that accelerate adoption of grids. My belief is that our best days are ahead of us and I look forward to your continued engagement in our community.

OGF HPC Profile, from page 5

also going to start focusing on one or more extensions. One of the first that we'll start with is the File Staging extension that I mentioned above. We will also work on a compliance suite for the HPC Basic Profile, which I think is really important – how do you know if a candidate service/client complies with the spec? This can be a tricky question. The compliance suite will help here and we're looking to leverage the excellent work of WS-I here. Overall, I think we made GREAT progress via the interop-fest at SC2006, and we'll be looking to continue our aggressive schedule in the beginning of 2007! And of course we're always looking for more people to get involved!

GC: Anything else you would like to add?

I'd just like to personally thank a few people. It's really tough to single out anyone, because it was really a team effort – I was continually impressed by the number of people on the teleconference calls and contributing to the email discussions. But certainly Chris Smith of Platform, Rich Ciapala of Microsoft, and Glenn Wasson of the University of Virginia deserve a special mention – their energy and technical skills really helped us identify and battle through some tough issues! It was really great to work closely with these guys. Andrew Grimshaw was important as well – he wasn't directly involved in the HPC Profile WG, but he was very interested in the success of BES, so he made sure that the BES WG was open and responsive to the comments coming from our HPC Profile WG. And certainly the WG as whole really appreciates the vision, technical expertise, and management of Marvin Theimer, who was with Microsoft until recently. It was Marvin who really pushed this effort and made it a success. Marvin is no longer engaged in this effort because of his new role at Amazon, and I really believe that we have a great momentum to successfully complete this effort, but without a doubt we would not be where we are today without Marvin.

OGF Events

OGF20 / May 7–11, 2007
Manchester International Convention Centre
Manchester, UK

OGF20, co-located with EGEE's 2nd User Forum and hosted by UK e-Science and the University of Manchester, is the premier global grid technologies event of 2007.

Group Updates

New Groups:

Build, Test and Certification of Grid Software Community Group
eScience Function
abbreviation: btc-cg
email: btc-cg@ogf.org
chair: Mark-Elian Bégin
meb@cern.ch
web page: https://forge.ogf.org/sf/projects/btc-cg

Grid and Virtualization Working Group
Standards Function, Infrastructure Area
abbreviation:gridvirt-wg
email: gridvirt-wg@ogf.org
chair: Erol Bozak
web page: https://forge.ogf.org/sf/projects/gridvirt-wg

Network Mark-up Language Working Group
Standards Function, Infrastructure Area
abbreviation: nml-wg
email: nml-wg@ogf.org
chairs: Martin Swany
swany@cis.udel.edu
and Paola Grosso
grosso@science.uva.nl
web page: https://forge.ogf.org/sf/projects/nml-wg

New Published Documents

GFD.84
Standardised Namespaces for XML Infosets in OGF
M. Drescher, A. Anjomshoaa

GFD.83
Firewall Issues Overview
R. Niederberger, W. Allcock, L. Gommans, E. Grünter, T. Metsch, I. Monga, G. L. Volpato, C. Grimm

GFD.82
Grid Information Retrieval System for Dynamically Reconfigurable Virtual Organization
Y. Kim

GFD.81
Open Grid Services Architecture Glossary of Terms Version 1.5
J. Treadwell

GFD.80
The Open Grid Services Architecture, Version 1.5
I. Foster, H. Kishimoto, A. Savva, D. Berry, A. Grimshaw, B. Horn, F. Maciel, F. Siebenlist, R. Subramaniam, J. Treadwell, J. Von Reich

GFD.79
Report for the GGF 16 BoF for Grid Developers and Deployers Leveraging Shibboleth
V. Welch

GFD.78
Grid Security Infrastructure Message Specification
V. Welch

GFD.77
Interoperability Testing for DAIS Working Group Specifications
S. Lynden, N. Paton, D. Pearson

GFD.76
Web Services Data Access and Integration – The Relational Realisation (WS-DAIR) Specification, Version 1.0
M. Antonioletti, B. Collins, A. Krause, S. Laws, J. Magowan, S. Malaika, N. Paton

GFD.75
Web Services Data Access and Integration – The XML Realization (WS-DAIX) Specification, Version 1.0
M. Antonioletti, S. Hastings, A. Krause, S. Langella, S. Lynden, S. Laws, S. Malaika, N. Paton Data

GFD.74
Web Services Data Access and Integration – The Core (WS-DAI) Specification, Version 1.0
M. Antonioletti, M. Atkinson, A. Krause, S. Laws, S. Malaika, N. Paton, D. Pearson, G. Riccardi Data

GFD.73
Application Contents Service Specification 1.0
K. Fukui

GFD.72
OGSA™ WSRF Basic Profile 1.0
I. Foster, T. Maguire, D. Snelling

GFD.71
A Requirements Analysis for a Simple API for Grid Applications
S. Jha, A. Merzky

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