Cyberinfrastructure User Support

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Targets for this session

Points of interest:

- Differences between CI and conventional IT
- CI user categories and differences in their support
- Human aspect of CI support (i.e. politics, conflicts)
- Problems common to most institutions/centers supporting CI
- Exchange different approaches/solutions to common problems
- CI education and training
- Lessons we've learned

These slides were provided by Mehmet (Memo) Belgin
Of Georgia Tech and are used with his permission.
Modest edits have been made.

Outline

Part I: CI user expectations, categorization and commonalities

Part II: Policies, Politics, Conflicts and Personality Management

Part III: Outreach and Education

Part IV: Lessons learned

Differences of CI from Conventional IT

- Application performance as the primary target
- Usually relies on conventional IT services (by a separate team)
- More focus on supporting end-users than services
- Uses common IT technologies in uncommon ways
- Requires specific middleware and software layers
- Requires code compilations using complicated mechanisms
- May require specific knowledge about the application/science
- Has irregular usage patterns (maybe not so different than IT?)

PART I

CI user expectations, categorization and commonalities

CI User Expectations

Faculty (a.k.a PI) (owner of research and maybe of resources, but not active users):

- Their students and collaborators have everything they need to get the work done (and on time).
- Maximum availability of resources
- Minimum communication with CI support staff
- Regular status reports

CI user expectations

Students/Collaborators (or computationally active PIs) :

- Ultra-fast learning curve

- Simple and instant solutions to complex problems

- Maximum communication with CI support staff

- Simulations running faster than their laptops (not always possible!)

- Help with diagnosing problems that are NOT related to systems

- An "insider friend" in the CI support staff

- Answers that match their level of knowledge

CI User Categories

- Three coarse categories:
    - Novice
    - Intermediate
    - Advanced
- Difficult to identify a user's category without any prior interaction
- The language used in requests is a good indicator
- Replies to follow-up questions also reveal their level of proficiency
- In case of uncertainty, assume "novice"

Category 1: Novice Users

Common Points:

- 75-80% of the support requests
- No/little Linux skills
- No/little experience with running the domain specific packages
- No/little understanding of the scientific fundamentals behind the packages
- Mostly identical or similar requests with straightforward solutions
- Usually not aware of the standard help channels
- May ask the impossible
- May type the examples in the help documents literally
- May feel insecure or apologetic when seeking for help

Category 1: Novice Users

Common Needs:

- Cluster orientation

- Linux 101

- E-mail list

- Easy text editor (nano?)

- Help with configuring their MS Windows/OSX systems

- Location of existing software

- Installation of new software

- Help with tools to move data in/out

- Help with the very first job submission script

Category 1: Novice Users

Common approaches for effective support:

- Do everything to build mutual trust.
- Provide regular orientations and help opportunities.
- Maintain up-to-date web documentation.
- Provide links to existing help locations.
- Suggest proper web search terms.
- Make them feel better about their simple (or sometimes stupid) questions.
- Explain all the steps for resolution in simple, replicable terms.
- Prefer exact list of commands to general/conceptual answers.
- Be very patient and polite!

Category 2: Intermediate Users

Common Points:

- 10-25% of the support requests
- Largest portion of the compute activity on the cluster
- Experience with clusters in the same or other institutions
- First to notice and report system problems
- Hybrid mix of straightforward and complex questions
- Advanced and multi-step scientific workflows
- Aware of the standard help channels
- Suggest solutions to their own problems and may not like what you did
- Act as the local technical expert and often train novice users in their group

Category 2: Intermediate Users

Common Needs:

- Advanced (and group-specific) information sessions
- Well-explained effective solutions
- More performance/efficiency from already running codes
- Specific modules/patches/versions for existing software
- Higher level of control on their jobs
- Access to specialized computational resources
- Configurations that may conflict with system defaults
- Code development/debugging/profiling support
- Data/statistics for the resolution of conflicts with other users

Category 2: Intermediate Users

Common approaches for effective support:

- Do everything to build mutual trust.
- Hold advanced classes to "teach how to fish."
- Schedule one-on-one meetings.
- Add exceptional/advanced cases to existing help pages.
- Present solid data/evidence instead of speculation.
- Admit to speculation if it is inevitable.
- Show complete transparency: they can separate excuses from facts.
- Get help from vendor support and user forums, keeping users CC'ed.
- Be very patient and polite!

Category 3: Advanced Users

Common Points:

- Experience with and access to multiple clusters
- Only a small fraction of support requests
- Inclination for bypassing the ticket system
- Usually complex problems with long resolution time
- Try to fix problems themselves, and see CI support as a last resort (i.e. when it's too late)
- Usually on the extremes; either hostile or extremely collaborative
- Too busy or advanced to act as the local expert for their group
- Have complex to incomprehensible workflows
- Usually acknowledge challenging problems, open to workarounds
- Suggest improvements on the systems (hardware and software) and provide useful feedback
- Open to experimentation with new systems and software
- Find bugs in libraries and applications

Category 3: Advanced Users

Common Needs:

- VIP treatment
- Direct and open communication channels
- Social contact
- Acknowledgement of their level of knowledge and intelligence
- High-level and direct vendor/developer support
- Lots of exceptions, even though they require violation of existing policies
- Almost everything else listed under "common intermediate users needs"
- Root password (the answer is still no)

Category 3: Advanced Users

Common approaches for effective support:

- Do everything to build mutual trust.
- Schedule one-on-one meetings.
- Try to learn more about their research, deadlines and aspirations.
- Be very careful saying that something is impossible.
- Make small exceptions as long as it does not impact other users.
- Avoid speculation as much as possible (as with all users).
- Be completely transparent: they can easily separate excuses from facts.
- Encourage them to contact vendor support or user forums.
- Be very patient and polite!

PART II

Policies, Politics, Conflicts and Personality Management

Policies

- Clear policies help keep user demands under control.
- Publish policies in places easy to find (online).
- Be prepared to explain the reasoning behind each policy item.
- Make policies as strict as possible, be open to exceptions when necessary.
- Encourage users to openly discuss and criticize the policies.
- Don't hesitate updating policies frequently to stay relevant.
- Build trust and effective communication with decision makers.
- Seek delegation privileges to speed things up.
- Don't make policies for resources you don't own, but influence them.

Politics and Conflicts

- Tricky but inevitable
- No magic formula, needs case-specific creative solutions
- Biggest challenge: conflicts due to limited resources
  - Configure systems to exactly match policies.
  - Collect and store data for past and present usage.
  - Provide users with tools to browse data/statistics for their accounts.
  - Run regular audits to defuse problems before they explode.

Tiers of Conflict

- **Internal to a group/department:** Usually easier to solve with communication and informal agreements.

- **Between groups/department:** Can get messy quick.

- **Between users and CI support staff:** Have clear policies handy as a basis for declining impossible requests, and keep solid statistics/data as evidence.

Personality Management

- Some users are difficult than others; why they behave that way is irrelevant.
- Do not take anything personally; report any harassment you may receive and do not retaliate.
- In most cases users do not mean bad, but they are extremely frustrated.
- If your mistake caused frustration, take responsibility and offer an apology.
- Show empathy and demonstrate sincere intention for resolution.
- Acknowledge that:
    - you understand the problem;
    - you are aware of its particular impact on the user.
- Be aware of, and show tolerance for cultural differences and language difficulties.
- Humor is powerful only when used appropriately, avoid being awkward or insulting.
- Don't wait until having a resolution, respond immediately to inform that you started working on the problem, and provide frequent updates.

PART III

Outreach and Education

Trainings and Tutorials

- Novice Users:
  - How to ask for help
  - Usage limitations and best practices
  - Basic Linux usage
  - Basic cluster access, concepts, scheduling system, software
  - Troubleshooting job related problems
- Intermediate Users
  - Debugging/optimization of codes (including parallel)
  - System architecture specific details
  - Advanced use of common tools (Scientific Python, Parallel MATLAB)

Group Consultations

- Mini-orientations for newly joining groups

- Departmental meetings to provide feedback for resolution of internal conflicts

- Resolution of technical problems that are specific to a group

- Technical feedback to assist in policy making and system purchases

- Introduction of services to new groups with interest in getting resources

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Grant Writing Help

Level 1: Answer questions (e.g. hardware specs, software licenses)

Level 2: Contribute facilities document, budget, letters of supports

Level 3: Writing and revising portions of the grant

Level 4: Initiate new grants to get more resources

Collaborations with Researchers and Vendors

- Research scientists helping research scientists
- Crucial for staying relevant
- Collaborative grant writing
- Collaborative projects/papers (in acknowledgements or as co-authors)
- Support for classes and workshops
- Developer/vendor collaborations
  - Bug tracking and fixes
  - Hardware/software feedback, evaluation of new systems and technology
  - Pilot studies

Scheduled Maintenance

- Set regular, strict dates, advance announcement.
- Specify primary and bonus goals, announce them beforehand.
- Predefined worst case downtime.
- Provide a summary of completed tasks after maintenance.
- Plan ahead in details:
    - Team member / task associations.
    - Estimated task duration.
    - Critical paths and B plans.
- Prepare to have unforeseen problems during and after the maintenance days.
- Show best effort for minimal impact.
    - Configure the scheduler to have no running jobs.
    - Disable user access to resources during the maintenance activities.

OK Supercomputing Symposium 2015

2003 Keynote:
Peter Freeman
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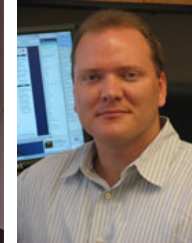Computer & Information
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2006 Keynote:
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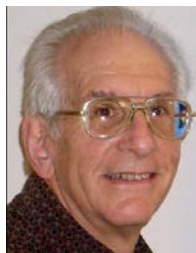Director
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Thanks for your attention!

Questions?

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