Recommendation for UC Irvine’s Next Campus-Wide Calendar

UCI Calendaring Task Force

September 12, 2011

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1 Executive Summary - Recommendation

In July, 2011 UC Irvine CIO Dana Roode convened a small task force, and charged it with

“…making a recommendation by September 12th regarding the best option for replacing UCI’s Oracle Calendar service and providing a campus-wide integrated calendar capability. The task force will also sketch out an implementation plan, including possible milestones and transition issues. Given past OIT research, market place realities and transition impacts, I have asked the task force to focus on Microsoft Exchange (UCI-hosted or in “the cloud”) and Google Apps for Higher Education as the major candidates. The right strategy might suggest one product or the other, or a combination of both...”

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The task force unanimously agreed that Microsoft Exchange is the best option to replace Oracle Calendar, and to serve as UC Irvine’s shared calendar for all faculty and staff. The task force also concluded that the campus should implement Microsoft-hosted Exchange, with service levels detailed in a UC/Microsoft contract currently being finalized at the UC Office of the President. This hosted option is being offered at no cost to UC faculty and staff. A low cost/no cost “cloud-based” alternative is consistent with recommendations from the recent UCI Academic IT Consolidation Report.

Members further agreed that a combination of more than one shared calendar platform for faculty and staff would be the most costly and least best solution.

The task force members reached this recommendation based on:

- product functionality,
- advice from similar institutions that have transitioned recently,
- number of campus users already using one of the two calendars,
- ability to make a smooth transition from Oracle calendar, and
- necessity to control costs.

In arriving at this recommendation, the task force “lived” in each candidate environment, using browsers, desktop “thick” clients and mobile devices,
performing tasks to evaluate each product both as users and assistants (delegates) for another’s calendar. Interviews via phone and email were conducted with other UC campuses and other research universities that have performed a similar campus calendar evaluation. Their advice, particularly when based on recent experience, was weighed heavily.

Committee members began this evaluation evenly split as to the best choice, with individuals from the largest Exchange departments predicting Google would likely surface as the best campus-wide choice. By the end of the process all task force members agreed as to the best choice.

The following sections of this report describe task force recommendations regarding implementation, followed by costs. The fourth section details key assumptions and the evaluation process.
2 Implementation

2.1 Calendar and Email Go Together

In going through a series of exercises, we quickly learned it is both inconvenient and error prone to separate a user’s calendar from their electronic mail. Thus, we believe most campus users will use a shared calendar and email on the same platform.

Both Google and Microsoft have robust electronic mail components, with substantially greater size quotas (25 GB each) than current campus systems afford.

2.2 A single shared calendar system

Every university interviewed that has tried to synchronize data from different shared calendar systems has recommended against doing so. Tools that exist are both costly and error prone. Of course, UC Irvine’s many users have differing needs and will undoubtedly use different calendars based on those needs. But to contain costs – including support costs – the campus must settle on a single shared calendar for booking meetings and adding rooms and conducting university business.

2.2.1 Student Interaction

The vast majority of Oracle Calendar users at UCI are administrative staff, followed by faculty administrators (deans, associate deans, chairs, etc.- see section 4 for a breakdown by school or department). Students are not offered Oracle Calendar accounts.

In Schools that have had faculty and students sharing the same calendar system, we found that few individual faculty make their availability viewable to students, and fewer still allow students to request a meeting on their calendars. While it may be a “plus”, we did not consider faculty and students on the same calendar a major consideration.

However, the hosted Exchange option also permits free use by students, and it would certainly be viable to make this an option for UCI’s student
population in future. Some Schools may even recommend all affiliates use the same service.

2.3 Exchange “…in the cloud…”

We recommend implementing this solution using the Microsoft Exchange Online service as part of the Office 365 for Education offering, as described in a contract under review at UC Office of the President. This service will reduce the ongoing cost of operating a campus Exchange installation, support the continuing use of newer Exchange versions as they are released and lessen the impact to the current OIT Exchange service and its clients.

This option is only viable should a contract between Microsoft and UC be finalized, which is expected by December 2011. The UC contract must contain provisions addressing UC requirements regarding using an outside service to conduct university business. These requirements will include privacy and security safeguards, and compliance with applicable regulations and UC policy. Pricing (zero cost for faculty and staff users) is guaranteed for three years, as it follows the term of the UCI Microsoft Campus Agreement. Advanced functionality, such as archiving and retention, is available through supplemental pricing, or via on-site Exchange.

Of course, Office 365 for Education is a new offering, although technically it is based on Microsoft's “Live at EDU” service. According to UCI's Microsoft representative, Live at EDU had 15 million accounts as of June, 2011 and experienced slightly greater than 99% up-time for the preceding 12 months ending June, 2011. Other specifics regarding this offering are described in Appendix I.

Should there be unforeseen issues with this service, as a fall back position we will have the ability to move UC Irvine Exchange users into the on-site OIT Exchange service.

Should this new offering prove successful, we also have the option of migrating existing campus Exchange users into Microsoft-hosted Exchange, at a significant cost savings. All calendar data will seamlessly flow between on-site Exchange and MS-hosted Exchange.

2.4 Migrating User Data

As Exchange is an integrated email and calendar platform, we believe users will be best served by adopting it for their email needs, as well as calendarizing. Thus the implementation plan includes data migration of existing email and calendar data, as a couplet, from other systems.
2.4.1 Calendar Data

We believe that user expectations for the campus calendaring system are very high, and that only full-fidelity migration of the data history will fulfill those expectations. Unfortunately, the only options that meet these criteria are additional-cost software and services available from third parties.

Our interviews with other institutions indicate that the offering from Sumatra Development, LLC yields very good results; one responder characterized it as “worth every penny”. (For cost projections, please see section 3.2)

Data migration with less fidelity may be achieved via export and import of user data in the iCalendar format. This solution achieves transfer of individual user agendas, with exceptions: meeting attendance is not linked across different attendees’ agendas; meeting attachments are lost.

2.4.2 Email

Email content can be migrated into Exchange via a number of means and toolsets. For clients of OIT’s IMAP service, the most ideal option would be server-side injection via IMAP. Migration with a user-level email client is also possible, but has proven tedious and error prone.

2.5 Timeline

As the current calendar product is past its end-of-life and unsupported, it would be best to proceed with the new solution in a timely way. We suggest that it would be feasible to begin the migration to Exchange calendaring during Winter Quarter 2012. We propose to begin configuring the Exchange environment at the time of this decision and make it available to the population and their supporters for local configuration and testing in advance of their calendar data migration.

2.6 User Client Software – (almost) any web browser

The web interface in Exchange 2010 provides the same interface and functionality to all browsers. We verified this in Office 365, using Mac and Windows versions of Firefox, Chrome, Safari and Internet Explorer. No “special” software is needed to use this service.

We expect that many Windows users will prefer Microsoft Outlook for their Exchange interaction. The OIT Desktop Support Group will be able to facilitate this on supported desktops. Mac OS X users will likely use the native Mail and iCal programs; Microsoft’s Outlook 2011 is also an option. Various clients in the Unix™ and Linux environments provide options for accessing Exchange calendars.
2.7 User Client Training

OIT support staff will provide training sessions for users to learn the new calendaring system, and email clients. These sessions can be placed in UCLC using the current model of one training-session per academic quarter. During the initial launch, additional sessions can be scheduled to meet campus demand. Training session curriculum shall be developed by the OIT training coordinator and conducted by the training coordinator in conjunction with the OIT Help Desk.

Other options include fee-based trainings by outside vendors, as well as online resources such as Lynda.com. These training options will help smooth the transition process of the campus calendaring system.

2.8 Additional work (Related)

2.8.1 AutoDiscover

In order to offer round-trip interoperability of calendaring and scheduling between cloud Exchange, OIT Exchange, and other installations at UCI (i.e. UCI Medical Center), Exchange AutoDiscover resolution of @uci.edu addresses – across all installations – will be necessary.

2.8.2 Identity Management

We recommend OIT build out its automated account provisioning systems to include the Exchange services and its underlying Active Directory. New user identities should be automatically created as part of a new campus identity, new mailboxes created, delivery points set, etc.

OIT may also implement federation, trust or password synchronization technologies between the Kerberos and Active Directory installations. This functionality should yield the appearance of single-identity and single-password experience in campus systems, regardless of the particular solution.
3 Containing Costs

3.1 Costs to Use hosted Exchange

As described earlier, Microsoft is following Google’s lead in making an exceptional service available to UC at no cost for faculty, staff and students, and pricing will remain fixed for 3-year terms.

The hosted option is a newer version of Exchange than the campus currently maintains, with approximately 6 times as much storage space. There will be an investment in OIT staff time to manage data migration from Oracle Calendar and email systems.

3.2 Data Migration

We propose that a full-fidelity data migration service be offered on a cost-share basis. An OIT subsidy assists departments during a critical budget environment; a minimal departmental cost insures that participating departments value and intend to stay with the service.

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<thead>
<tr>
<th>Cost Item</th>
<th>Note</th>
<th>Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sumatra Development</td>
<td>Educational list, can be lower with high levels of self-support. Estimate extended across full population of 2,000 users.</td>
<td>$20.00/user</td>
<td>$40,000.00</td>
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<tr>
<td>OIT Subsidy</td>
<td>Estimate assumes 100% migration. Partially offset by savings in Oracle maintenance.</td>
<td>($10.00)</td>
<td>($20,000.00)</td>
</tr>
<tr>
<td>Department Cost</td>
<td></td>
<td>($10.00)</td>
<td>($20,000.00)</td>
</tr>
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</table>
3.3 Backup Plan – UCI-hosted Exchange

The approved recharge rate for OIT managed on-campus Exchange, at $70/user per year, reflects the actual costs to run the service. Thus, if at some point in the future the existing 2,000 Oracle Calendar users need to join the on-campus Exchange service, it would cost the campus an additional $140,000 per year.

On the other hand, should this new service prove successful, up to 2,610 current UCI Exchange users could migrate to the Microsoft-hosted solution, saving $182,700 per year.
4 Evaluation Process

4.1 Shared Calendar Users at UC Irvine

Shared Calendar Users at UCI, as of 9/2011

- Health Affairs Exchange, 6,000
- OIT Exchange, 1,000
- OIT Oracle Calendar, 2,000
- Other UCI Exchange, 1,610
Oracle Calendar Users at UCI, as of 9/2011

- Administrative & Business Services, 408
- OIT, 260
- Student Affairs, 209
- Library, 151
- Engineering, 79
- Arts, 79
- Social Sciences, 79
- Physical Sciences, 75
- Humanities, 73
- Biological Sciences, 71
- DUE, 67
- Education, 66
- Dean of Students, 43
- Planning & Budget, 41
- Social Ecology, 47
- Units with 18 or fewer users (~16), 101
4.2 Usecase Populations

The needs and likely usage patterns of existing Oracle Calendar (OCal) users were weighed most heavily, although any recommendation must be appropriate for new calendar users as well. It is critical that faculty and staff be served by the same shared calendar system, as faculty often move in and out of administrative roles (as Deans, Associate Deans, Chairs, Directors, etc.).

4.3 Key Advice from Other Universities

Not a single university reported successfully moving all users off of Exchange and on to Google Calendar. Those that tried ended up with both – the most costly and error prone solution.

Attempting to synchronize calendar data between two dissimilar systems, such as Exchange and Google, is both unreliable and expensive. Several companies offer services to assist with this problem, however none were recommended.

Google's Calendar Connector is only compatible with Exchange 2007, and not forecasted to be updated for Exchange 2010.

4.4 Product Testing

Our task force tested the candidate products in standardized calendar operations: individual events, events with recurring patterns, delegate scheduling, exceptions to recurring patterns, events with multiple participants, locating meeting availability, etc. We prioritized our testing on the cloud products (Google Calendar, Office 365); as Office 365 is an implementation of Exchange 2010, we felt that it better represented the platform than UC Irvine's on-site installations of Exchange 2007.

4.4.1 Support for different clients, platforms, devices

Both products support an array of clients for each of Windows, Mac OS X, and mobile devices. Our task force tested the most probable client combinations for each solution. In our testing, events created or responded to in a given client displayed with parity in other client combinations. The only anomalies were within vendor documentation for their client and protocol support.
4.4.2 Full Functionality using Web Browser Clients

The web browser applications of both Google and Office 365 offer full functionality to all tested browsers (Chrome, Firefox, Internet Explorer, Safari) and platforms (Mac OS X, Windows, Linux).

Both products accommodated the calendaring and scheduling operations within our testing.

4.4.2.1 Google Calendar

All testers agree that the Google interface, while functional, is awkward and inefficient with respect to group calendaring.

- The Create Meeting function is built for a personal event. There is not a workflow that takes one directly to building a group event. (Figure 5.1)
- The field to enter an attendee’s name is 26 “Tab” keys away from the selection for the meeting date. (Figure 0)
- Adding a resource (room) is in the same location as adding attendees.
- One cannot see a list of people throughout the enterprise. Discovery of possible attendees is via search.

4.4.2.2 Some desirable features, Office 365

All testers agree that Office 365’s web application offers a robust interface and workflow for group calendaring. Alternate interfaces for new meeting creation are available for either individual events (Figure 5.3) or group meetings (Figure 5.4). The meeting request’s interface includes the invitee and resource fields directly in the tab-to-field workflow; data entry is immediately met with auto-complete from the enterprise directory. A complete enterprise Address Book is readily available.

Office 365’s browser interface is very close to that of the desktop Outlook program, with very little difference in features between the browser and desktop clients.

Office 365’s browser interface makes intensive use of JavaScript. As a result, a user’s performance perception may vary with different browsers.

4.4.3 Windows “thick” clients

The task force believes that the vast majority of Windows users will be heavily motivated to use Outlook as their email and calendaring client.

4.4.3.1 Google Calendar

- Google Apps Sync for Microsoft Outlook
  
  In our testing, this plugin for Outlook worked within expectations. However, a number of Outlook features do not map to Google
Calendar, and are unsupported\(^1\). We feel this lapse will be confusing to users and generate additional support costs, particularly from users already used to Outlook.

- Thunderbird/Lightning

We expect users who seek this solution will be outliers in our constituency.; this client combination was not tested. This solution leverages Google’s support of the CalDAV standard; see section 4.4.4.1 for additional discussion.

### 4.4.3.2 Office 365

The default and premier client for Windows, with Exchange, is Microsoft Outlook. In our testing this combination offered its full breadth of calendaring and scheduling features.

One tester observed an issue wherein Outlook 2010 could not retain a reliable connection with the cloud server. This issue was traced to the configuration of a test virtual machine, and not replicated in later testing.

All other testing of Outlook 2007/2010 with Office 365 was remarkable for its lack or remarkable observations – when used with desktop Outlook, Office 365 looks and acts just like an on-site installation of Microsoft Exchange.

### 4.4.4 Mac OS X “thick” clients

#### 4.4.4.1 Google Calendar

- Apple iCal

  Working within iCal’s sometimes-puzzling interface, we were able to create, modify and respond to all events in our test suite. Round-trip interoperability of events between iCal and other clients went as expected.

  Our testers noted that iCal in Lion is dramatically different– not necessarily improved – than prior releases of Mac OS X.

  Google supports iCal via CalDAV; their implementation is documented with several known issues\(^2\). Google Apps customers often note that a CalDAV-connected client can be prone to losing state with respect to the cloud’s source of truth. This intermittent error state leads to user confusion and frustration.

\(^1\) [http://mail.google.com/support/bin/answer.py?answer=156466](http://mail.google.com/support/bin/answer.py?answer=156466)  
\(^2\) [http://www.google.com/support/calendar/bin/answer.py?answer=99360](http://www.google.com/support/calendar/bin/answer.py?answer=99360)
4.4.4.2 Office 365

- Apple iCal
  iCal is supported as a native Exchange client, via Microsoft’s Exchange Web Services (EWS) protocol. Our prior comments regarding iCal hold true with Exchange as well.

- Outlook 2011
  Outlook is a new Exchange client for Mac OS X, replacing Entourage from prior versions of Microsoft Office. Like iCal it connects to Exchange via EWS; the overall functionality is likewise similar and within expectations.

  We note that Outlook for Mac OS X is quite different from Outlook for Windows, despite sharing the name. Outlook for Mac OS X lacks many features that are in its Windows counterpart; it also lacks a few features which were in the prior Entourage client.

4.4.5 Mobile support.

Both products support major mobile platforms via the Exchange ActiveSync (EAS) protocol and Blackberry Enterprise Server. Our testing included several EAS devices of the Apple iOS and Google Android platforms. We did not explicitly test Blackberry devices within this evaluation.

EAS is a Microsoft protocol, available via licensing to other implementers; Microsoft’s implementation is therefore the standard bearer, and most complete. As Office 365 is proposed as a forever-most-current implementation of Exchange, we believe that it will always be the most advanced implementation. In contrast, Google’s implementation did not accommodate meeting responses from iOS devices until June, 2011.

4.5 Product Comparisons

Both Exchange and Google are extremely capable systems, and both would work fine for UCI users. We did have a few preferences for Exchange, however:

- ability to select users and rooms from a global address list when requesting a meeting;

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• automatically “find next available time” given a set of people and rooms;
• meetings automatically show as tentative when requested but before an individual accepts or rejects the invitation;
• events on an Exchange calendar can be marked as “busy”, “free”, “tentative”, or “out of the office”. This status provides additional information to someone requesting a meeting.

4.6 Other University Migrations

Our interviews with other institutions using, migrating now, or already migrated from Oracle Calendar, showed that migrations are heavily weighted toward Microsoft Exchange. These choices reflect Exchange’s market presence and long life as an enterprise messaging solution. Being that Office 365 is a very recent cloud entry, existing migrations have been to on-site installations, or Live@EDU.

A small number of institutions have selected Google Apps for Education. All of these were chosen in very recent months. (See Section 6, Appendix II)
5 Figures

5.1 Google Calendar Quick Add
5.2 Google Calendar Create Event

![Google Calendar Create Event](image-url)
5.3  **Office 365 New Meeting**

![Office 365 New Meeting Screenshot]

5.4  **Office 365 New Meeting Request**

![Office 365 New Meeting Request Screenshot]
6 Appendices
COSTS - Office 365

The diagram below shows the service tiers and Estimated Retail Prices for Office 365. The UC price will be lower through the MCCA contract and an alternative Site License model that Shel may provide Dana with more insights on.

License costs:
Exchange Online Plan 1 (25 GB mailbox, with mail, calendar, contacts and tasks) is free for Faculty, Staff and Students. It is also free for Alumni as extension of Faculty/Staff deployment
Once available, Lync Online and SharePoint Online will also be free for Students

License structure:
All of the Office 365 components can be subscribed to on a per individual basis rather than having to license an entire department, college, or campus.
For example, the subset of users that need Advanced Archiving would be licensed for Exchange Online Plan 2, others would be on the free Exchange Online Plan 1 service.

You have the option of signing the Advanced Archiving requiring users with the A3 plan or you can just sign them up for Exchange Online Plan 2 (not show below) at the Estimated Retail Price of $4 / month.
TIMING –

From: Clarke, John [mailto:john.clarke@uci.edu]  Sent: Tuesday, August 30, 2011 9:45
The following are questions from John Clarke, answered by Jeff Williams and Derek Seymour at Microsoft:

Q1: [John Clarke] Could we create resource accounts (for Rooms to be scheduled) for Exchange Plan 1, or 2, or Office365? This would be critical.

A: [Microsoft] Yes, Resource mailboxes are fully supported in Exchange Online (all Plans). They are sometimes also referred to as Room mailboxes. Each Resource Mailbox has its own calendar that can be shared with others, and its settings can be managed by one or more users that are granted the administration rights to do so.

Q 2: [John Clarke] We would be moving ~ 2,000 Oracle Calendar users to hosted exchange, would may use Sumatra to help us transfer existing calendar data. Is that possible with any MS hosted Exchange plan (if so which one)?

A 2: [Microsoft] The Sumatra tools are well-proven for Oracle calendar migration, and support migration directly to Exchange Online (all Plans). They work well when moving all users at once. Some customers have used an alternative tool called Heit SimplerWeb (now renamed CalMover), to support a phased migration; however, it require two-step process of migrating calendar to Exchange Server first, before migrating to Exchange Online. This is an item we should examine in more detail as part of overall deployment scope and planning.

Q 3: [John Clarke] When UCOP does sign an Office 365 contract, what would UCI need to do to extend the full Office 365 application suite to faculty/staff already on a hosted Exchange Plan 1, or 2?

A 3: [Microsoft] UCI would order the appropriate number of licenses of the Office 365 suite, and activate those licenses on the user accounts. The existing Exchange Online activation for each user account (whether Plan 1 or Plan 2) would remain unchanged, but each would then additionally be able to use the Lync Online and SharePoint Online services.

Q 4: [John Clarke] Is there already a contract between UC and Microsoft for Exchange plan 1 or 2? This too would be critical

A 4: [Microsoft] Office 365 T&C’s are still being reviewed and we are making progress. If Dana would like to get a peer perspective on Office 365, I recommend that he reach out to Shel Waggener at Berkeley.

Q 5: [John Clarke] Given we could only proceed with a contract in place, does a December 2011 implementation start seem doable to you.

A 5: [Microsoft] The implementation project can start as soon as contract terms for Office 365 are signed and UCI license order submitted. To scope the project fully, and assist UCI with design and
deployment decisions, Microsoft recommends scheduling an on-site Solution Alignment Workshop at the earliest possible date. Based on current information, a project timeline of between 8 and 12 weeks is to be expected for initial phase, including preparation, deployment and migration, with the full project to complete in 2012.

A number of factors will influence the timing and sequence of deployment, including the number of users and the size of the mailboxes and calendars to be migrated.

ANTICIPATED UC / Microsoft Contract

From: John Clarke <john.clarke@uci.edu>
Date: Wed, 31 Aug 2011 14:53:14 -0700
To: Jeff Williams <jewilli@microsoft.com>
Cc: Derek Seymour <dseymour@microsoft.com>, Andrew Laurence <atlauren@uci.edu>, "mangrich@uci.edu" <mangrich@uci.edu>, Dana Roode <Dana.Roode@uci.edu>
Subject: no hosted Exchange contract for UC, only Office 365, but no eta on what that'll be signed?

...uci> so I take this to mean, "no, there is no contract in place between UC and Microsoft for hosted exchange options."

For us that would mean we'd either need to get an agreement signed before we could use hosted Exchange for university work, or wait for Office 365 agreement to be signed. That'd be fine if it would be done by December, but we would need a definite answer to this question.

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From: Jeff Williams <jewilli@microsoft.com>
Date: Wed, 31 Aug 2011 15:13:29 -0700
To: John Clarke <john.clarke@uci.edu>
Cc: Derek Seymour <dseymour@microsoft.com>, Andrew Laurence <atlauren@uci.edu>, "mangrich@uci.edu" <mangrich@uci.edu>, Dana Roode <Dana.Roode@uci.edu>
Subject: RE: no hosted Exchange contract for UC, only Office 365, but no eta on what that'll be signed?

Hi John,

The holdup on the T&C’s is the HIPAA Business Associates Addendum (BAA). This is being addressed and there is a meeting to work this out at the end of the week. I anticipate the contracts being in place by the end of September.

Berkeley is also using Oracle Cal and their plan is to migrate users in December 2011.

Jeff Williams | Account Manager | Microsoft | Phone: 425.705.1001 | jewilli@microsoft.com
Appendix II

Universities Similar in Size / Rank to UC Irvine that Have Recently Selected Google or Exchange as Campus Calendar
UCI Calendaring Task Force - August, 2011

<table>
<thead>
<tr>
<th>University</th>
<th>Exchange</th>
<th>Google</th>
<th>Migration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>UC Riverside</td>
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<td></td>
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<td>Illinois Urbana-Champaign</td>
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<td>U Maryland</td>
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<td>Dartmouth</td>
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<tr>
<td>Ohio</td>
<td>1</td>
<td></td>
<td>&quot;this spring&quot;</td>
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<tr>
<td>Purdue</td>
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<td>Rice</td>
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<td>&quot;probably&quot;</td>
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