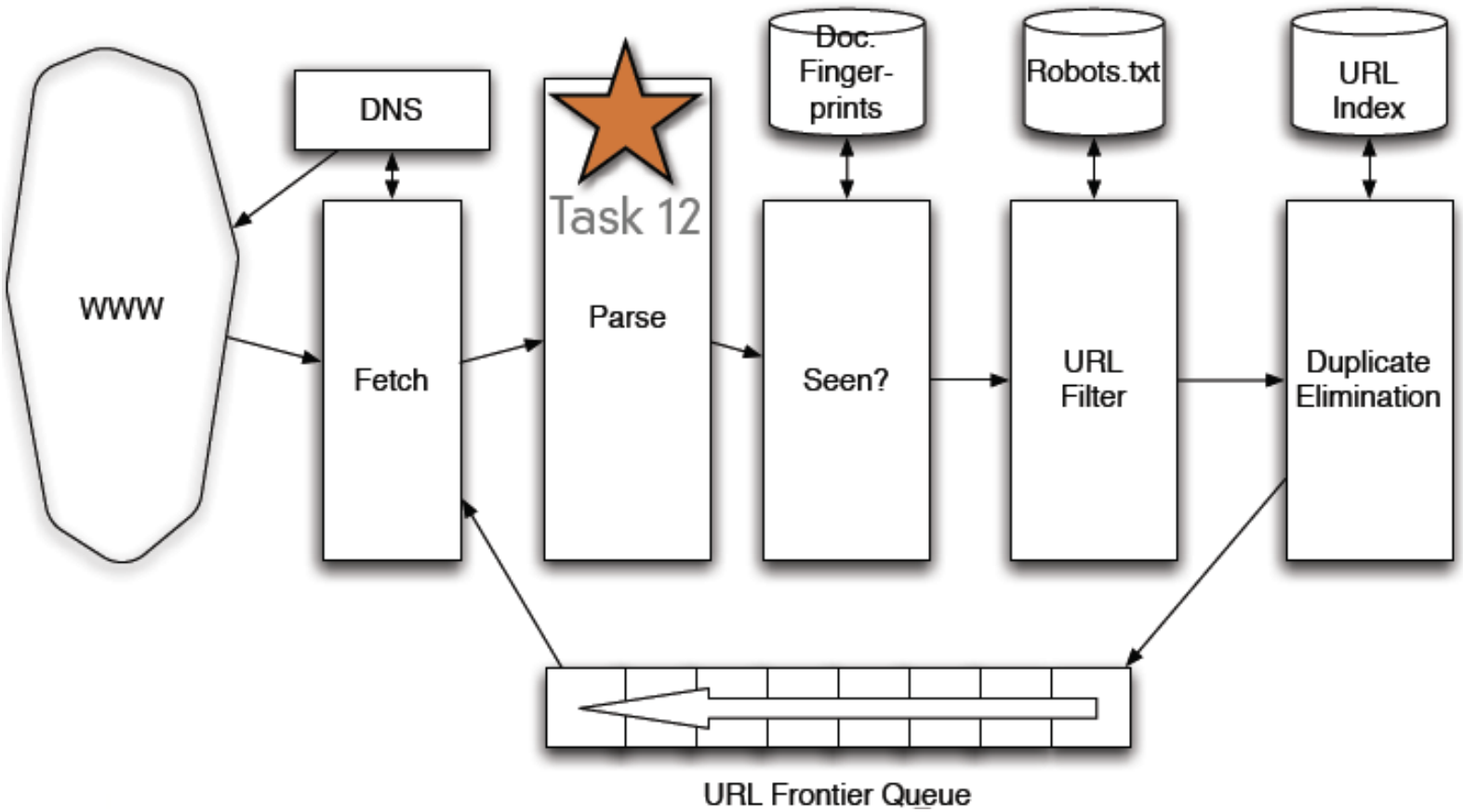
Discussion 3: crawler4j

Jan 22nd, 2014

Content adapted from http://code.google.com/p/crawler4j/

Recall: a robust crawl architecture



* Adapted from Jan 21 lecture

Crawler4j makes it easy

Configure your crawler
- local storage folder
- number of crawlers
- max depth/pages
- Politeness
- user agent string
- Proxy
- Resumable
- add seed

Start crawling

```
while (fetch next url from frontier)
    If(this page should be visited)
        Extract data from this page
        Process data
        Extract outgoing links from this page
        Add links to frontier
```

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implement a crawler

- Extends from WebCrawler class and override two methods
  - boolean shouldVisit(WebURL url);
    - this function determines if a given url should be crawled (based on your own logic)
  - void visit(Page page);
    - This function is where your processing happen
      - Build index, record page statistics
- Outgoing links are added to frontier by crawler4j

create a CrawlController

```
public class Controller {
        public static void main(String[] args) throws Exception {
                String crawlStorageFolder = "/data/crawl/root";
                int numberOfCrawlers = 7;

                CrawlConfig config = new CrawlConfig();
                config.setCrawlStorageFolder(crawlStorageFolder);

                /*
                 * Instantiate the controller for this crawl.
                 */
                PageFetcher pageFetcher = new PageFetcher(config);
                RobotstxtConfig robotstxtConfig = new RobotstxtConfig();
                RobotstxtServer robotstxtServer = new RobotstxtServer(robotstxtConfig, pageFetcher);
                CrawlController controller = new CrawlController(config, pageFetcher, robotstxtServer);

                /*
                 * For each crawl, you need to add some seed urls. These are the first
                 * URLs that are fetched and then the crawler starts following links
                 * which are found in these pages
                 */
                controller.addSeed("http://www.ics.uci.edu/~welling/");
                controller.addSeed("http://www.ics.uci.edu/~lopes/");
                controller.addSeed("http://www.ics.uci.edu/");

                /*
                 * Start the crawl. This is a blocking operation, meaning that your code
                 * will reach the line after this only when crawling is finished.
                 */
                controller.start(MyCrawler.class, numberOfCrawlers);
        }
}
```

A local folder for intermediate crawl data

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Number of concurrent crawling threads

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Nothing needs to be changed here

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```

Here are your url seeds

other configurations

- Maximum crawl depth: default is -1 for unlimited depth.
- A -> B -> C -> D: A has depth 0. Max depth = 2 means D won't be crawled

WebCrawler.java | RobotstxtServer.java | BasicCrawlController | BasicCrawler.java | »4

```
CrawlConfig config = new CrawlConfig();

config.setCrawlStorageFolder(crawlStorageFolder);

/*
 * Be polite: Make sure that we don't send more than 1 request per
 * second (1000 milliseconds between requests).
 */
config.setPolitenessDelay(1000);

/*
 * You can set the maximum crawl depth here. The default value is -1 for
 * unlimited depth
 */
config.setMaxDepthOfCrawling(1);

/*
 * You can set the maximum number of pages to crawl. The default value
 * is -1 for unlimited number of pages
 */
config.setMaxPagesToFetch(1000);
```

other configurations

- Maximum number of pages to crawl: default is no limit

WebCrawler.java | RobotstxtServer.java | BasicCrawlController | BasicCrawler.java | »4

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other configurations

- Politeness

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```

other configurations

- User agent string: used for representing your crawler to web services. Default is

  "crawler4j (http://code.google.com/p/crawler4j/)".

- To change:

```
crawlConfig.setUserAgentString(userAgentString);
```

other configurations

- Proxy

```
* if you need to use proxy
    config.setProxyHost("proxyserver.example.com");
    config.setProxyPort(8080);
* If your proxy also needs authentication:
    config.setProxyUsername(username);
    config.getProxyPassword(password);
```

other configurations

- Resumable crawling
  - If your crawler will run for a long time
  - Possible unexpected termination
  - Resume from a previously stopped/crashed crawl

```
crawlConfig.setResumableCrawling(true);
```

Other issues

- robots.txt
  - robotstxtServer.allows(webURL): check if a url is allowed to be crawled
  - Details of how crawler4j finds robots.txt

    RobotstxtServer.fetchDirectives(URL url);

- Duplicated urls
  - WebCrawler.processPage(WebURL curURL);
  - Relies on a docid. Details are in class DocIDServer.

learn more about crawler4j

- http://code.google.com/p/crawler4j/
  - All content in this presentation is adapted from this site
  - Limited documentation on the site
  - Source code available
    - git repository: https://crawler4j.googlecode.com/git/.
  - Download samples: https://crawler4j.googlecode.com/archive/e14a296409390eaba34108481b2ce779e0d99bbf.zip
    - Crawler4j source code is available in the sample package

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